Shifler Mining and Reclamation Project

Traffic Impact Study

Prepared for:

Taylor & Wiley
Teichert

August 2018
RS14-3195

Prepared by

FEHR PEERS

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INTRODUCTION

This study summarizes the potential off-site transportation impacts of the proposed Shifler Mining and Reclamation project in Yolo County, California. The proposed project consists of a proposed aggregate mining site located adjacent to rural agricultural land within Yolo County. The project site is proposed to supply aggregate via electric conveyor to Teichert's adjacent Woodland Plant, an existing aggregate processing facility that is permitted to process and sell up to 1.2 million tons of aggregate annually. Teichert is considering increasing the maximum allowed production at the Woodland Plant to up to 2.2 million tons of aggregate annually, by shifting its existing 1 million ton per year mining allotment at its Esparto Plant to the Woodland Plant. This study assesses the potential impacts the increase in maximum permitted production will likely have on the local roadways and intersections.

Traffic operations analysis including peak hour intersection and roadway segment analysis was performed for the following scenarios:

- Scenario 1: Production of 1.2 million tons per year at the Woodland Plant (existing permitted maximum)
- Scenario 2: Production of 1.5 million tons per year at the Woodland Plant (existing permitted maximum plus 300,000 tons per year of existing permitted Esparto Plant volume)
- Scenario 3: Production of 1.8 million tons per year at the Woodland Plant (existing permitted maximum plus 600,000 tons per year of existing permitted Esparto Plant volume)
- Scenario 4: Production of 2.2 million tons per year at the Woodland Plant (existing permitted maximum plus 1 million tons per year of existing permitted Esparto Plant volume)

ANALYSIS METHODOLOGY

Level of service (LOS) is a qualitative measure of traffic operating conditions, whereby a letter grade, from A to F is assigned. 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.

INTERSECTION OPERATIONS

The study intersections were analyzed using Synchro 8 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 Chapter 18 of the *HCM 2010*. 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

Chapters 19 and 20 of the *HCM 2010* describes the method for evaluating LOS and delay at unsignalized 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. For side street stop controlled intersections, delay is calculated for each stop controlled movement and for the uncontrolled left turns, if any, from the main street. The delay and LOS for the intersection as a whole and for the worst movement are reported for side street stop controlled intersections. 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 SIGNALIZED INTERSECTION LOS 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

Sources:
[1] *Highway Capacity Manual 2010*, Chapter 18, Signalized Intersections
[2] *Highway Capacity Manual 2010*, Chapter 19, Two Way Stop Controlled Intersections
Highway Capacity Manual 2010, Chapter 20, All Way Stop Controlled Intersections

ROADWAY SEGMENT OPERATIONS

Roadway segment operations were analyzed using the methods contained in Chapter 15 of the *HCM 2010* which provides instruction for evaluating the LOS of a two-lane highway. Three factors are considered when evaluating the LOS of a two-lane highway:

- *Average Travel Speed* (ATS) reflects mobility on a two-lane highway.
- *Percent Time Spent Following* (PTSF) represents the freedom to maneuver and the comfort and convenience of travel.
- *Percent of Free-Flow Speed* (PFFS) represents the ability of vehicles to travel at or near the posted speed limit.

The LOS criteria for two-lane highways are shown in Table 2.

TABLE 2 TWO-LANE HIGHWAY LOS CRITERIA

LOS	Class I Highways		Class II Highways	Class III Highways
	ATS (mph)[1]	PTSF (%)[2]	PTSF (%)[2]	PFFS (%)[3]
A	> 55	≤ 35	≤ 40	> 91.7
B	> 50-55	> 35-50	> 40-55	> 83.3-91.7
C	> 45-50	> 50-65	> 55-70	> 75.0-83.3
D	> 40-45	> 65-80	> 70-85	> 66.7-75.0
E	≤ 40	> 80	> 85	≤ 66.7

Notes: [1] ATS = Average Travel Speed, mph = miles per hour
[2] PTSF = Percent Time Spent Following
[3] PFFS = Percent Free-Flow Speed
Sources: *Highway Capacity Manual 2010*, Chapter 15, Two-Lane Highways

ROADWAY SEGMENT CAPACITY ANALYSIS

The capacity of roadway segments was evaluated by comparing peak hour traffic volumes to the traffic volume LOS thresholds in the Yolo County *2030 Countywide General Plan Environment Impact Report* (EIR) (April 2009). Table 3 displays the LOS capacity thresholds by facility type.

TABLE 3 PEAK HOUR LEVEL OF SERVICE THRESHOLDS FOR ROADWAY SEGMENTS					
Facility Type	**Peak Hour Level of Service Capacity Threshold per Direction**				
	A	**B**	**C**	**D**	**E**
Minor Two-Lane Highway	90	200	680	1,410	1,740
Major Two-Lane Highway	120	290	790	1,600	2,050
Two-Lane Arterial	-	-	970	1,760	1,870
Sources: *Yolo County 2030 Countywide General Plan EIR*, April 2009					

FREEWAY SEGMENT OPERATIONS

Freeway mainline segments (basic sections) were analyzed using the methods contained in Chapter 11 of the *HCM 2010*. Basic freeway segment LOS is defined by density, which is determined based on a vehcile's proximity to other vehicles and the freedom to maneuver within the traffic stream. Table 4 presents the LOS thresholds for freeway mainline segments.

TABLE 4 FREEWAY MAINLINE LEVEL OF SERVICE		
Level of Service	**Description**	**Density (pcplpm)[1]**
A	Represents free flow. Individual users are virtually unaffected by others in 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
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 Sources: *Highway Capacity Manual 2010*, Chapter 11, Basic Freeway Segments		

Freeway on- and off-ramps (merge and diverge sections) were analyzed using the methods contained in Chapter 13 of the *HCM 2010*. Merge/diverge segment LOS is defined in terms of density for LOS A – E

(stable flow conditions). If the freeway demand exceeds capacity of the upstream segment for diverge sections or the downstream segment for merge sections, or if the off-ramp demand exceeds the off-ramp capacity, then LOS F conditions exist. Table 5 presents the LOS thresholds for freeway merge and diverge sections.

TABLE 5 RAMP MERGE AND DIVERGE LEVEL OF SERVICE

Level of Service	Description	Density (pcplpm)[1]
A	Unrestricted operations	≤ 10
B	Merging and diverging maneuvers noticeable to drivers	> 10 to 20
C	Influence area speeds begin to decline	> 20 to 28
D	Influence area turbulence becomes intrusive	> 28 to 35
E	Turbulence felt by virtually all drivers	> 35
F	Ramp and freeway queues form	Demand exceeds capacity

Notes: [1] pcplpm = passenger cars per lane per mile
Sources: *Highway Capacity Manual 2010*, Chapter 13, Freeway Merge and Diverge Segments

LEVEL OF SERVICE STANDARDS

The Circulation Element of the Yolo County *2030 Countywide General Plan* (April 2009) defines the minimum acceptable operation level for its roadways and intersections in the unincorporated county to be LOS C. Certain exceptions are outlined in Policy CI-3.1 of the *General Plan*. These exceptions include the following study roadways and intersections:

B. Interstate 5 (Interstate 505 to Woodland City Limit) – LOS D is acceptable. LOS D is anticipated by Caltrans according to the Interstate 5 Transportation Concept Report 1996 to 2016 (Caltrans, April 1997).

H. State Route 16 (Interstate 505 to County Road 98) – LOS D is acceptable, assuming that passing lanes and appropriate intersection improvements are constructed. The County will secure a fair share towards these improvements from all feasible sources.

EXISTING CONDITIONS

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

STUDY AREA

The project study area, shown on Figure 1, is near the City of Woodland, California and contained entirely within Yolo County. The study area roads and intersections primarily service rural areas, with the exception of Interstate 5 and Interstate 505, which also service regional traffic.

The following roadways, intersections, and freeway facilities were selected for study based on the project's potential for impact:

Roadways

- County Road 96 – County Road 20 to SR 16
- County Road 20 – West of County Road 96
- County Road 20 – County Road 96 to County Road 98
- SR 16 – I-505 to County Road 94B
- SR 16 – County Road 94B to County Road 96
- SR 16 (County Road 98) –County Road 20 to I-5

Intersections

- County Road 20/County Road 96
- State Route (SR) 16/County Road 96
- County Road 20/County Road 97
- County Road 20/SR 16 (County Road 98)
- SR 16/Interstate 5 (I-5) Southbound Ramps
- SR 16/I-5 Northbound Ramps
- SR 16/County Road 94B
- SR 16/I-505 Northbound Ramps
- SR 16/I-505 Southbound Ramps

Freeway Mainline Segments

- I-5 NB south of SR 16
- I-5 NB north of SR 16

- I-5 SB south of SR 16
- I-5 SB north of SR 16
- I-505 NB south of SR 16
- I-505 NB north of SR 16
- I-505 SB south of SR 16
- I-505 SB north of SR 16

Freeway Ramp Junctions (Merge/Diverge)

- I-5 NB off-ramp to SR 16
- I-5 NB loop on-ramp from SR 16
- I-5 NB on-ramp from SR 16
- I-5 SB off-ramp to SR 16
- I-5 SB on-ramp from SR 16
- I-505 NB off-ramp to SR 16
- I-505 NB loop on-ramp from SR 16
- I-505 NB on-ramp from SR 16
- I-505 SB off-ramp to SR 16
- I-505 SB loop on-ramp from SR 16
- I-505 SB on-ramp from SR 16

ROADWAY SYSTEM

Interstate 5 (I-5) is a north-south highway that runs from the southern border of California to the northern border of Washington. Within the project area, I-5 is a divided highway with two lanes in each direction. The posted speed limit is 70 mph in the project area.

Interstate 505 (I-505) is a divided north-south highway that runs from I-80 in Vacaville in the south to I-5 in rural Yolo County in the north. I-505 has two lanes in each direction for its entire length, and posted speed limit of 70 mph in the project area.

State Route 16 (SR 16) is an east-west roadway from west of I-505 to County Road 98, at which point State Route 16 runs north-south to I-5. SR 16 is a two-lane roadway with a speed limit of 55 mph.

County Road 20 is a rural east-west roadway that extends from the Teichert Woodland Plant in the west to County Road 102 in the east, at which point the roadway becomes Beamer Road. County Road 20 intersects SR 16 (County Road 98) west of I-5, and becomes Kentucky Avenue in the developed area east of SR 16. County Road 20 is a two-lane roadway with a speed limit of 50 mph within the project vicinity (west of SR 16).

County Road 94B is a rural north-south roadway that extends from County Road 24 (Gibson Road) in the south to County Road 95 in the north. County Road 94B is a two-lane roadway with a speed limit of 45 miles per hour (mph).

County Road 96 is a rural north-south roadway that extends from County Road 24 (Gibson Road) in the south to Magnolia Canal in the north. Within the project area, County Road 96 is a two-lane roadway with a speed limit of 50 miles per hour (mph).

County Road 97 is a rural north-south roadway that extends from County Road 27 in the south to County Road 20 in the north. County Road 97 is a two-lane roadway with a speed limit of 50 miles per hour (mph).

County Road 98 is a north-south roadway that that serves as the west border of the City of Woodland. County Road 98 is a two-lane roadway with a speed limit of 55 mph in the project area. County Road 98 shares a route with SR 16 and I-5 Business Loop from its intersection with SR 16 to I-5.

EXISTING TRANSIT FACILITIES

Yolobus Route 215 runs along SR 16 from Cache Creek Casino to the City of Woodland. Service is provided daily from 4:55 AM to 1:55 AM, with six round trips in the morning (4:55 AM to 10:55 AM), six round trips in the afternoon (12:55 PM to 7:03 PM), and five round trips at night (8:55 PM to 1:55 AM).

Yolobus Route 217 runs along I-5 from the City of Woodland to Dunnigan on Tuesdays and Thursdays only. One round trip is provided in the morning from 8:50 AM to 10:19 AM, and one round trip is provided in the afternoon from 2:15 PM to 4:00 PM. All trips start and end in Woodland.

EXISTING BICYCLE AND PEDESTRIAN FACILITIES

Due to the rural nature of the project study area, existing bicycle and pedestrian facilities are minimal. Within the project area, the only existing pedestrian and bicycle facilities are located at the intersection of County Road 20 and State Route 16. At this intersection, there are crosswalks, pedestrian push buttons, and sidewalks on all corners. The other roadways and intersections are void of existing bicycle and pedestrian facilities.

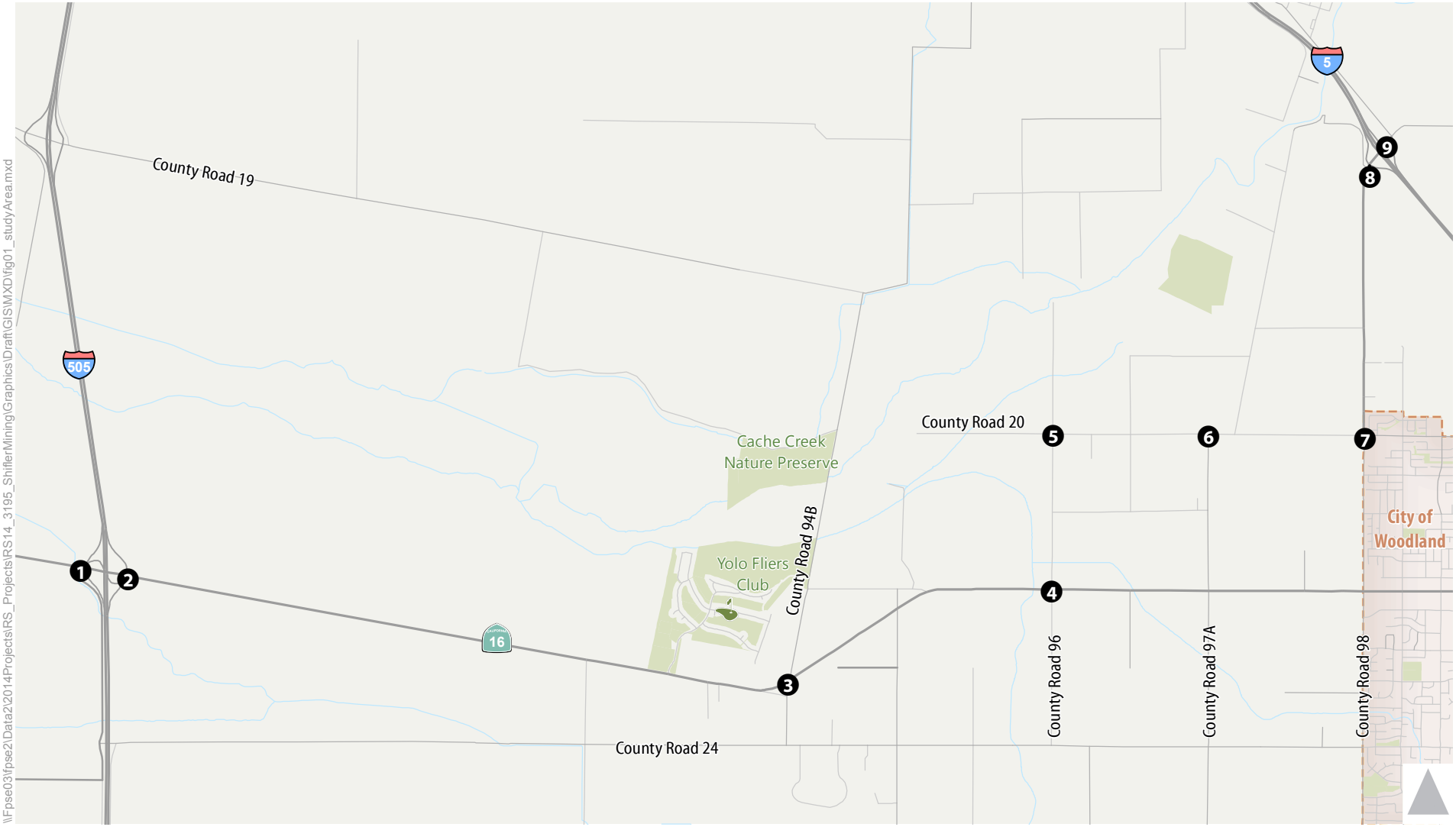


Figure 1

Study Area

EXISTING TRAFFIC VOLUMES

Morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak period intersection turning movement volumes were collected at the study intersections on January 28, 2014. Since peak mining production at the Teichert Woodland Plant occurs during the summer months, additional counts were collected at the SR 16 (County Road 98)/County Road 20 and SR 16/County Road 96 intersections on July 31, 2014. The "summer" counts were compared to the "winter" counts to determine if summer traffic volumes are higher at the study intersections. The count data showed that the counts collected in January were higher than the counts collected in July; therefore, the January counts were used in the intersection analysis. Existing traffic volumes at the study intersections are shown on Figure 2. The raw traffic count data is provided in Appendix A.

Production levels at the Woodland Plant vary depending on market conditions and other factors. Although the Woodland Plant is permitted to process and sell up to 1.2 million tons of aggregate annually, production levels at the Woodland Plant were well below those levels during the periods in which traffic counts were conducted. Thus, although the traffic counts reflect existing conditions, i.e., those existing on January 28, 2014, they may not reflect typical aggregate operations that have occurred in recent years. For example, as recently as 2010, production and sales at the Woodland Plant were approximately 1 million tons per year.

EXISTING INTERSECTION OPERATIONS

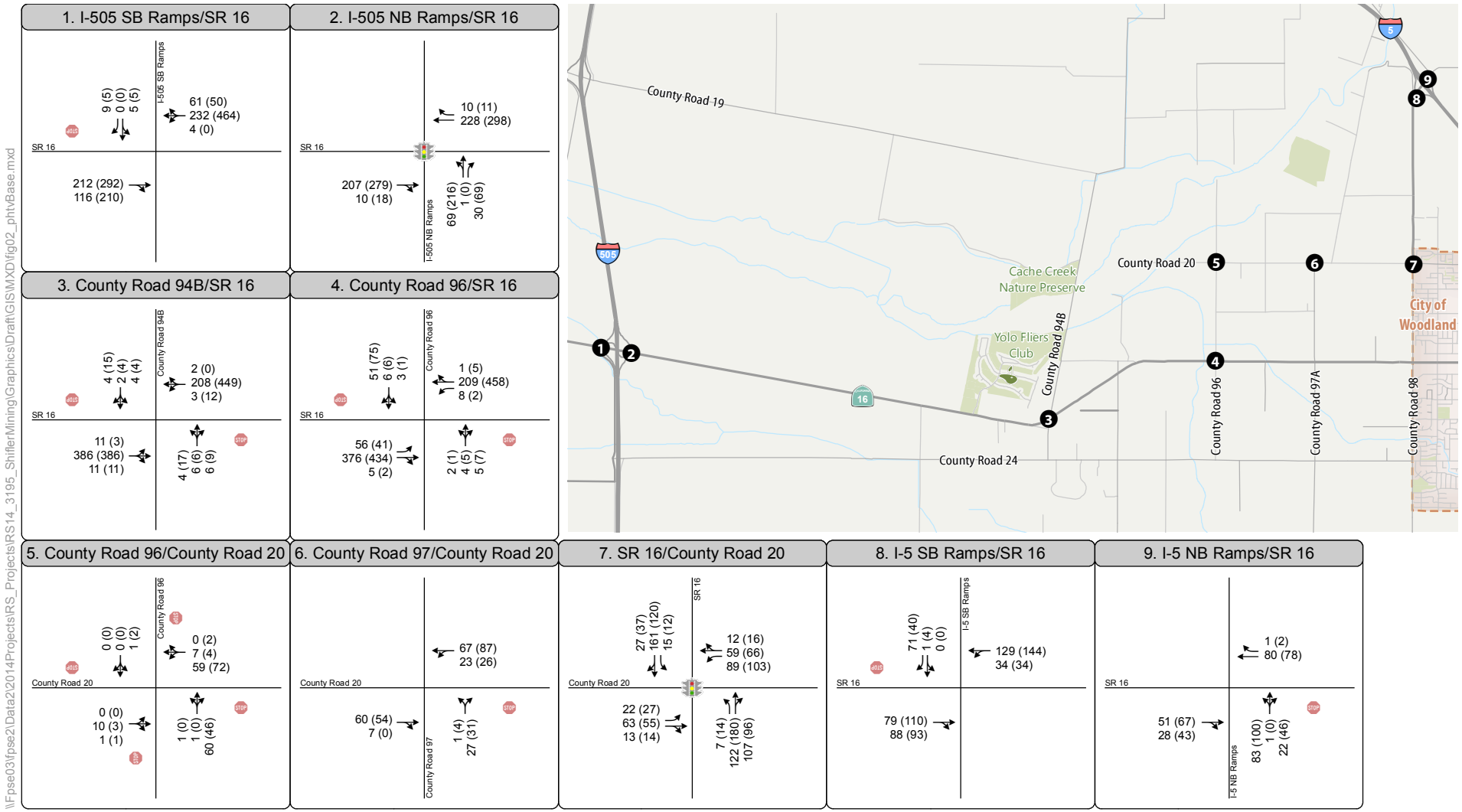
Existing intersection delay and LOS were calculated for the study intersections using Synchro 8 software, which utilizes *HCM 2010* methodology. The existing peak hour traffic volumes, intersection lane configurations, and traffic controls are shown on Figure 2. Table 6 shows the existing delay and LOS results at the study intersections. The technical calculations are provided in Appendix B.

TABLE 6 INTERSECTION LEVEL OF SERVICE – EXISTING CONDITIONS

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS	Delay[1]	LOS
1. SR 16/I-505 Southbound Ramps	Side Street Stop	1 (15)	A (B)	1 (20)	A (C)
2. SR 16/I-505 Northbound Ramps	Traffic Signal	6	A	7	A
3. SR 16/County Road 94B	Side Street Stop	1 (16)	A (C)	2 (22)	A (C)
4. SR 16/County Road 96	Side Street Stop	2 (17)	A (C)	2 (18)	A (C)
5. County Road 20/County Road 96	All Way Stop	7	A	7	A
6. County Road 20/County Road 97	Side Street Stop	2 (9)	A (A)	3 (9)	A (A)
7. County Road 20/SR 16 (County Road 98)	Traffic Signal	15	B	15	B
8. SR 16/Interstate 5 (I-5) Southbound Ramps	Side Street Stop	3 (12)	A (B)	2 (15)	A (B)
9. SR 16/I-5 Northbound Ramps	Side Street Stop	4 (10)	A (A)	5 (10)	A (B)

Notes: [1] For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for the overall intersection. For unsignalized (side street stop controlled) intersections, average intersection delay is reported in seconds per vehicle for the overall intersection (worst movement). All results are rounded to the nearest second.
Source: Fehr & Peers, 2015

As shown in Table 6, the study intersections currently operate at acceptable levels of service during the weekday AM and PM peak hours.



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Turn Lane

AM (PM) Peak Hour Traffic Volume

1 Study Intersection

Traffic Signal

Stop Sign

Figure 2

Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions

EXISTING ROADWAY SEGMENT OPERATIONS

Existing peak hour roadway segment operations analysis was performed using Highway Capacity Software (HCS) 2010 which utilizes *HCM 2010* methodology. LOS was determined by comparing the resulting Percent Time Spent Following (PTSF) to the thresholds provided in Table 2. Table 7 shows the LOS results for the study roadway segments. The technical calculations are provided in Appendix C.

TABLE 7 ROADWAY SEGMENT LEVEL OF SERVICE – EXISTING CONDITIONS

Roadway - Location	Roadway Classification[1]	AM Peak Hour ATS (mph)[2]	AM Peak Hour PTSF (%)[3]	LOS	PM Peak Hour ATS (mph)	PM Peak Hour PTSF (%)	LOS
SR 16 – I-505 to County Road 94B	Class I Highway	EB – 44.3 WB – 44.9	EB – 68.6 WB – 46.7	D D	EB – 42.9 WB – 43.7	EB – 65.6 WB – 68.2	D D
SR 16 – County Road 94B to County Road 96	Class I Highway	EB – 44.0 WB – 44.6	EB – 67.0 WB – 47.7	D D	EB – 41.7 WB – 42.4	EB – 70.4 WB – 72.5	D D
County Road 96 – County Road 20 to SR 16	Class II Highway	NA[2]	NB - 27.4 SB – 23.0	A A	NA[2]	NB – 15.9 SB – 15.1	A A
County Road 20 – West of County Road 96	Class II Highway	NA[2]	EB – 15.9 WB – 14.5	A A	NA[2]	EB – 13.2 WB – 14.2	A A
County Road 20 – County Road 96 to County Road 98	Class II Highway	NA[2]	EB – 32.9 WB – 33.0	A A	NA[2]	EB – 30.7 WB – 33.0	A A
SR 16 (County Road 98) – County Road 20 to I-5	Class II Highway	NB – 47.7 SB – 47.4	NB – 40.1 SB – 49.4	C C	NB – 47.4 SB – 47.6	NB – 48.8 SB – 44.1	C C

Notes: [1] Based on *Highway Capacity 2010*
[2] Average Travel Speed (ATS) is only reported for Class I Highways based on HCM 2010 methodology
[3] PTSF = Percent Time Spent Following
Source: Fehr & Peers, 2015

As shown in Table 7, all study roadway segments currently operate acceptable levels of service during the weekday AM and PM peak hours.

EXISTING ROADWAY SEGMENT CAPACITY ANALYSIS

Peak hour roadway segment capacity analysis was performed using the Peak Hour Level of Service Thresholds for Roadway Segments table in the Yolo County *2030 Countywide General Plan EIR* (April

2009), shown in Table 3. The LOS traffic volume thresholds are based on facility type and number of lanes. Table 8 shows the peak hour roadway segment LOS capacity analysis results.

TABLE 8 ROADWAY SEGMENT CAPACITY ANALYSIS – EXISTING CONDITIONS

Roadway - Location	Roadway Classification[1]	Number of Lanes	AM Peak Hour		PM Peak Hour	
			One-Way Volume	LOS	One-Way Volume	LOS
SR 16 – I-505 to County Road 94B	Conventional Two-Lane Highway	2	EB – 408 WB – 216	C B	EB – 400 WB – 481	C C
SR 16 – County Road 94B to County Road 96	Conventional Two-Lane Highway	2	EB – 437 WB – 262	C B	EB – 477 WB – 534	C C
County Road 96 – County Road 20 to SR 16	Local Roadway	2	NB - 66 SB – 59	NA NA	NB - 45 SB – 89	NA NA
County Road 20 – West of County Road 96	Local Roadway	2	EB – 11 WB – 9	NA NA	EB – 4 WB – 4	NA NA
County Road 20 – County Road 96 to County Road 98	Local Roadway	2	EB – 102 WB – 90	NA NA	EB – 96 WB – 117	NA NA
SR 16 (County Road 98) – County Road 20 to I-5	Conventional Two-Lane Highway	2	NB – 167 SB – 200	B B	NB – 203 SB – 184	B B

Notes: [1] Based on *Yolo County 2030 Countywide General Plan*
NA – The General Plan does not provide capacity thresholds for Local Roadways.
Source: Fehr & Peers, 2015

As shown in Table 8, the study roadway segments operate at acceptable levels of service under existing conditions.

EXISTING FREEWAY OPERATIONS

Existing peak hour freeway segment analysis was performed based on *HCM 2010* methodology. Table 9 shows the peak hour freeway segment LOS results for the basic, merge, and diverge segments on I-5 at SR 16 and on I-505 at SR 16. The technical calculations are provided in Appendix D.

TABLE 9 FREEWAY LEVEL OF SERVICE – EXISTING CONDITIONS

Freeway - 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
I-5 Northbound	South of SR 16	Basic	0.18	6.1	A	0.20	6.9	A
	SR 16 Off-Ramp	Diverge	0.19	10.3	B	0.22	11.3	B
	SR 16 Loop On-Ramp	Merge	0.16	10.0	B	0.18	10.7	B
	SR 16 On-Ramp	Merge	0.16	9.3	A	0.18	10.0	A
	North of SR 16	Basic	0.16	5.4	A	0.18	6.0	A
I-5 Southbound	North of SR 16	Basic	0.16	5.4	A	0.18	6.1	A
	SR 16 Off-Ramp	Diverge	0.17	9.0	A	0.19	9.9	A
	SR 16 On-Ramp	Merge	0.18	10.1	B	0.21	11.2	B
	South of SR 16	Basic	0.17	5.8	A	0.20	6.8	A
I-505 Northbound	South of SR 16	Basic	0.07	2.3	A	0.11	3.6	A
	SR 16 Off-Ramp	Diverge	0.07	5.5	A	0.12	7.1	A
	SR 16 Loop On-Ramp	Merge	0.05	5.8	A	0.05	5.7	A
	SR 16 On-Ramp	Merge	0.05	6.1	A	0.05	6.1	A
	North of SR 16	Basic	0.05	1.7	A	0.05	1.6	A
I-505 Southbound	North of SR 16	Basic	0.05	1.6	A	0.05	1.6	A
	SR 16 Off-Ramp	Diverge	0.05	5.0	A	0.05	4.9	A
	SR 16 Loop On-Ramp	Merge	0.06	5.8	A	0.06	5.7	A
	SR 16 On-Ramp	Merge	0.09	6.9	A	0.11	7.6	A
	South of SR 16	Basic	0.09	3.1	A	0.11	3.7	A

Notes: [1] v/c Ratio = volume-to-capacity ratio
[2] pcplpm = passenger cars per lane per mile
Source: Fehr & Peers, 2015

As shown in Table 9, the study freeway facilities currently operate acceptable levels of service during the weekday AM and PM peak hours.

THRESHOLDS OF SIGNIFICANCE

According to the Yolo County *Transportation Impact Analysis Guidelines*, the following thresholds of significance shall be used to determine if an impact is significant and requires mitigation:

On-Site Circulation

- Project designs for on-site circulation, access, and parking areas fail to meet County or industry standard design guidelines.
- A project fails to provide adequate accessibility for service and delivery trucks on-site, including access to truck loading areas.

Off-Site Traffic Operations

- A roadway segment or intersection operates acceptably according to Policy CI-3.1 of the *General Plan* under a no project scenario and the addition of project trips causes overall traffic operations on the facility to operate unacceptably.
- A roadway segment or intersection operates unacceptably according to Policy CI-3.1 of the *General Plan* under a no project scenario and the project adds 10 or more peak hour trips.

Bicycle Facilities

- A project disrupts existing or planned bicycle facilities or conflicts with adopted County non-auto plans, guidelines, policies, or standards.
- The project adds trips to an existing transportation facility or service (e.g., bike path) that does not meet current design standards.

Pedestrian Facilities and Americans with Disabilities Act (ADA) compliance

- A project fails to provide accessible and safe pedestrian connections between buildings and to adjacent streets and transit facilities.
- A project disrupts existing or planned pedestrian facilities or conflicts with adopted County non-auto plans, guidelines, policies, or standards.
- The project adds trips to an existing transportation facility or service (e.g., sidewalk) that does not meet current design standards.

Parking

- A project increases off-site parking demand above that which is desired according to the County in the immediate project area.

Neighborhood Electric Vehicles (NEV)

- A project fails to consider NEVs in site design.
- A project disrupts existing or planned NEV facilities or conflicts with adopted County NEV plans, guidelines, policies, or standards.

Trucks (or other heavy vehicles)

- A project fails to provide safe accommodation of forecast truck traffic or temporary construction-related truck traffic.
- The project adds 100 daily passenger vehicle trips (or equivalent – see Section 2 Vehicle and Truck Trip Equivalencies) to an existing roadway that does not meet current County design standards (e.g., structural section, horizontal and vertical curves, lane and shoulder width, etc.).

Transit

- A project creates demand for public transit services above the crush load capacity that is provided or planned.
- A project disrupts existing or planned transit facilities and services or conflicts with adopted County non-auto plans, guidelines, policies, or standards.

Intersection Traffic Control

- The addition of project traffic causes an all-way stop-controlled or side street stop-controlled intersection to meet Caltrans signal warrant criteria. All intersections shall first be evaluated with roundabout intersection control.

General Plan Consistency

- A project conflicts or creates inconsistencies with General Plan policies. For specific plans, this includes exceedance of the 44 VMT generated per household per weekday threshold established in Policies CI-3.18 and CI-3.19.

Other Subject Areas

- The construction of a project creates a temporary but prolonged impact due to lane closures, need for temporary signals, emergency vehicles access, traffic hazards to bikes/pedestrians, damage to roadbed, truck traffic on roadways not designated as truck routes, etc.

Other Jurisdictional Requirements

- The project exceeds established significance criteria thresholds for locations under the jurisdiction of other agencies.

PROJECT CONDITIONS

PROJECT TRAVEL CHARACTERISTICS

The Teichert Woodland Plant keeps detailed records of every load that exits the plant on each day of the year. Data from the last five years (2009 to 2013) was used as the basis for the trip generation analysis. A thorough review of the data showed that 2010 most closely represents project conditions since the Woodland Plant produced approximately 1,000,000 tons of aggregate that year. Therefore, the 2010 data was used to develop trip generation estimates for the proposed project.

In 2010, the Woodland Plant produced 40,096 loads of material, with each load averaging 25 tons. In order to determine the number of trips generated by the proposed project, the number of loads of material must be determined. Table 10 shows the number of loads of material generated by each analysis scenario, assuming 25 tons of material per load.

TABLE 10 TRUCK LOADS OF MATERIAL

Analysis Scenario	Tons of Material Produced per Year	Tons per Truck Load[1]	Number of Truck Loads
1	1,200,000	25	48,000
2	1,500,000	25	60,000
3	1,800,000	25	72,000
4	2,200,000	25	88,000

Notes: [1] Based on historical data.
Source: Fehr & Peers, 2015

In order to determine the AM and PM peak hour trip generation of the project, trip generation rates were developed using the historical data. The annual data was evaluated to determine the 30th highest number of loads produced during the AM peak hour and the 30th highest number of loads produced during the PM peak hour. The 30th highest hour is often cited in transportation literature (such as *A Policy on Geometric Design of Highways and Streets*, 4th Edition, American Association of State Highway and Transportation Officials, 2001) and is used to establish the "design hourly volume." It is meant to represent a busy, but not absolute peak period of travel. Table 11 shows these values based on the 2010 data from the Teichert Woodland Plant.

TABLE 11 30TH HIGHEST PEAK HOUR LOADS - 2010

AM Peak Hour			PM Peak Hour		
Date	**Hour**	**Number of Loads**	**Date**	**Hour**	**Number of Loads**
8/23	8 AM to 9 AM	95	9/20	4 PM to 5 PM	14
9/15	7 AM to 8 AM	89	8/2	4 PM to 5 PM	13
8/23	7 AM to 8 AM	88	8/3	4 PM to 5 PM	12
11/4	7 AM to 8 AM	74	11/12	4 PM to 5 PM	11
9/14	8 AM to 9 AM	73	2/1	4 PM to 5 PM	9
8/24	8 AM to 9 AM	71	9/24	4 PM to 5 PM	9
9/2	8 AM to 9 AM	71	7/8	4 PM to 5 PM	8
9/14	7 AM to 8 AM	69	10/14	4 PM to 5 PM	7
9/17	7 AM to 8 AM	69	7/21	4 PM to 5 PM	6
9/15	8 AM to 9 AM	66	9/9	4 PM to 5 PM	6
11/4	8 AM to 9 AM	66	9/14	4 PM to 5 PM	6
9/13	7 AM to 8 AM	66	8/2	5 PM to 6 PM	5
11/3	7 AM to 8 AM	65	6/16	4 PM to 5 PM	5
9/17	8 AM to 9 AM	64	9/8	4 PM to 5 PM	5
11/3	8 AM to 9 AM	63	10/28	4 PM to 5 PM	5
9/2	7 AM to 8 AM	60	9/15	5 PM to 6 PM	4
8/31	8 AM to 9 AM	55	9/20	5 PM to 6 PM	4
9/1	7 AM to 8 AM	55	1/30	4 PM to 5 PM	4
9/13	8 AM to 9 AM	54	4/7	4 PM to 5 PM	4
8/31	7 AM to 8 AM	53	9/15	4 PM to 5 PM	4
7/23	8 AM to 9 AM	52	9/23	4 PM to 5 PM	4
8/19	8 AM to 9 AM	52	9/24	5 PM to 6 PM	3
9/1	8 AM to 9 AM	52	5/13	4 PM to 5 PM	3
8/30	8 AM to 9 AM	49	6/3	4 PM to 5 PM	3
9/10	8 AM to 9 AM	49	9/4	4 PM to 5 PM	3
8/18	7 AM to 8 AM	49	9/13	4 PM to 5 PM	3
5/24	7 AM to 8 AM	48	12/13	4 PM to 5 PM	3
8/18	8 AM to 9 AM	47	5/11	5 PM to 6 PM	2
6/4	7 AM to 8 AM	47	9/4	5 PM to 6 PM	2
10/21	8 AM to 9 AM	46	11/12	5 PM to 6 PM	2
Percent of Yearly Loads (46 / 40,096)		0.115%	Percent of Yearly Loads (2 / 40,096)		0.005%

Source: Fehr & Peers, 2015

TRIP GENERATION ESTIMATES

Based on the data shown in Table 11, 0.115 percent of the annual loads are produced during the AM peak hour and 0.005 percent of the annual loads are produced during the PM peak hour. These rates were used to determine the AM and PM peak hour trip generation estimates for each analysis scenario (shown in Table 12.)

TABLE 12 TRUCK LOADS OF MATERIAL

Analysis Scenario	Tons of Material Produced per Year	Tons per Truck Load[1]	Number of Truck Loads per Year	AM Peak Hour Loads[2]	AM Peak Hour Trips[3]	PM Peak Hour Loads	PM Peak Hour Trips[3]
1	1,200,000	25	48,000	55	110	2	4
2	1,500,000	25	60,000	69	138	3	6
3	1,800,000	25	72,000	83	166	4	8
4	2,200,000	25	88,000	101	202	4	8

Notes: [1] Based on historical data.
[2] Based on a rate of 0.115% of Annual Loads – based on historical data.
[3] Based on 2 trips per load (1 trip in/1 trip out).
[4] Based on a rate of 0.005% of Annual Loads – based on historical data.
Source: Fehr & Peers, 2015

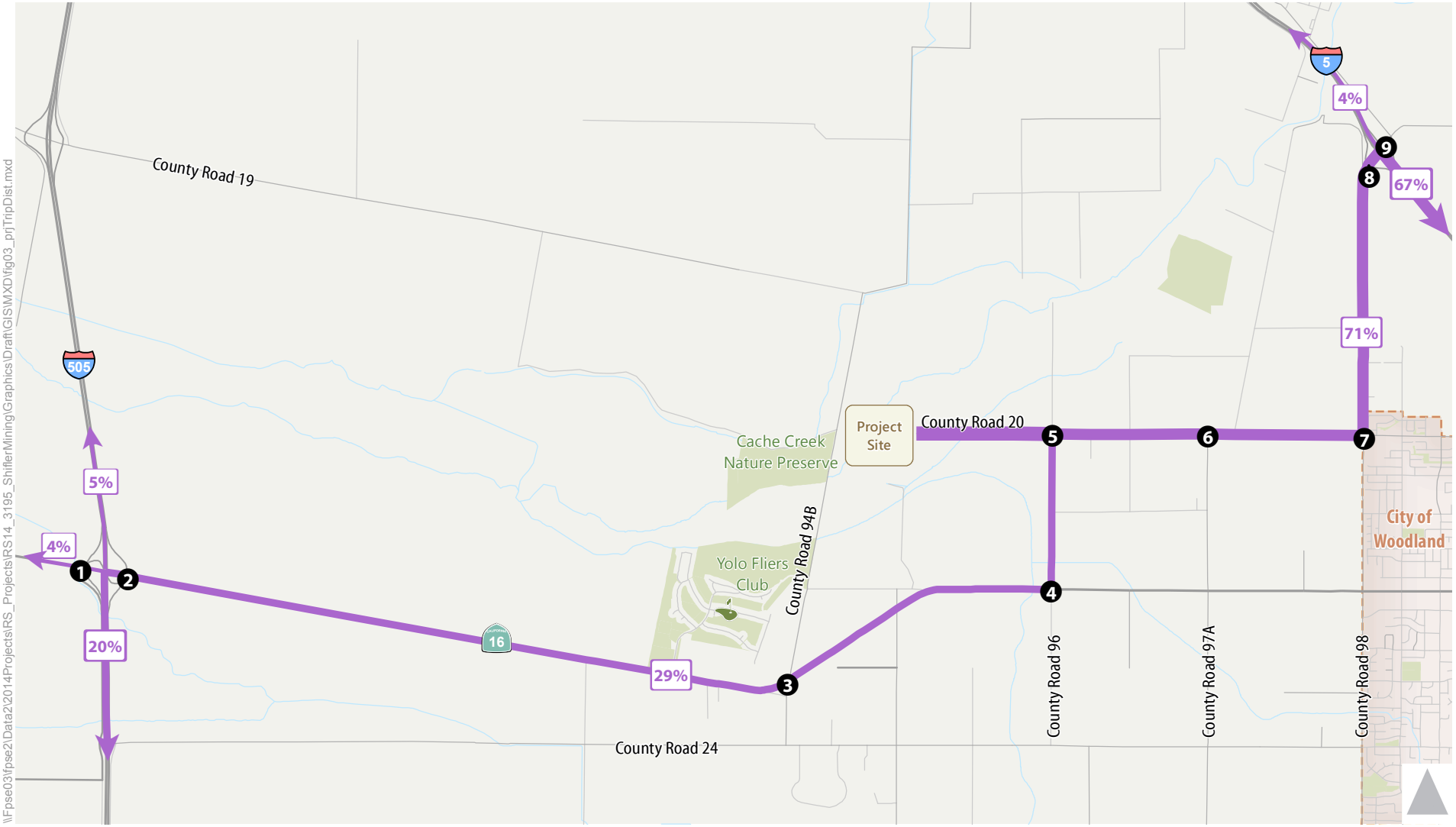
As shown in Table 12, Scenario 1 is expected to generate 110 AM peak hour trips and 4 PM peak hour trips. Scenario 4 is expected to generate 202 AM peak hour trips and 8 PM peak hour trips.

PROJECT TRIP DISTRIBUTION

Project generated traffic volumes were distributed to the surrounding roadway network based on existing travel patterns at the Woodland Plant. Project trips were distributed based on the following:

- 4% to/from north on I-5 via County Road 20 and County Road 98
- 67% to/from south on I-5 via County Road 20 and County Road 98
- 5% to/from north on I-505 via County Road 20, County Road 96, and SR 16
- 20% to/from south on I-505 via County Road 20, County Road 96, and SR 16
- 4% to/from west on SR 16 via County Road 20 and County Road 96

Figure 3 shows the project trip distribution.



1 Study Intersection

Trip Distribution

Park / Open Space

Figure 3

Project Trip Distribution

EXISTING PLUS PROJECT CONDITIONS

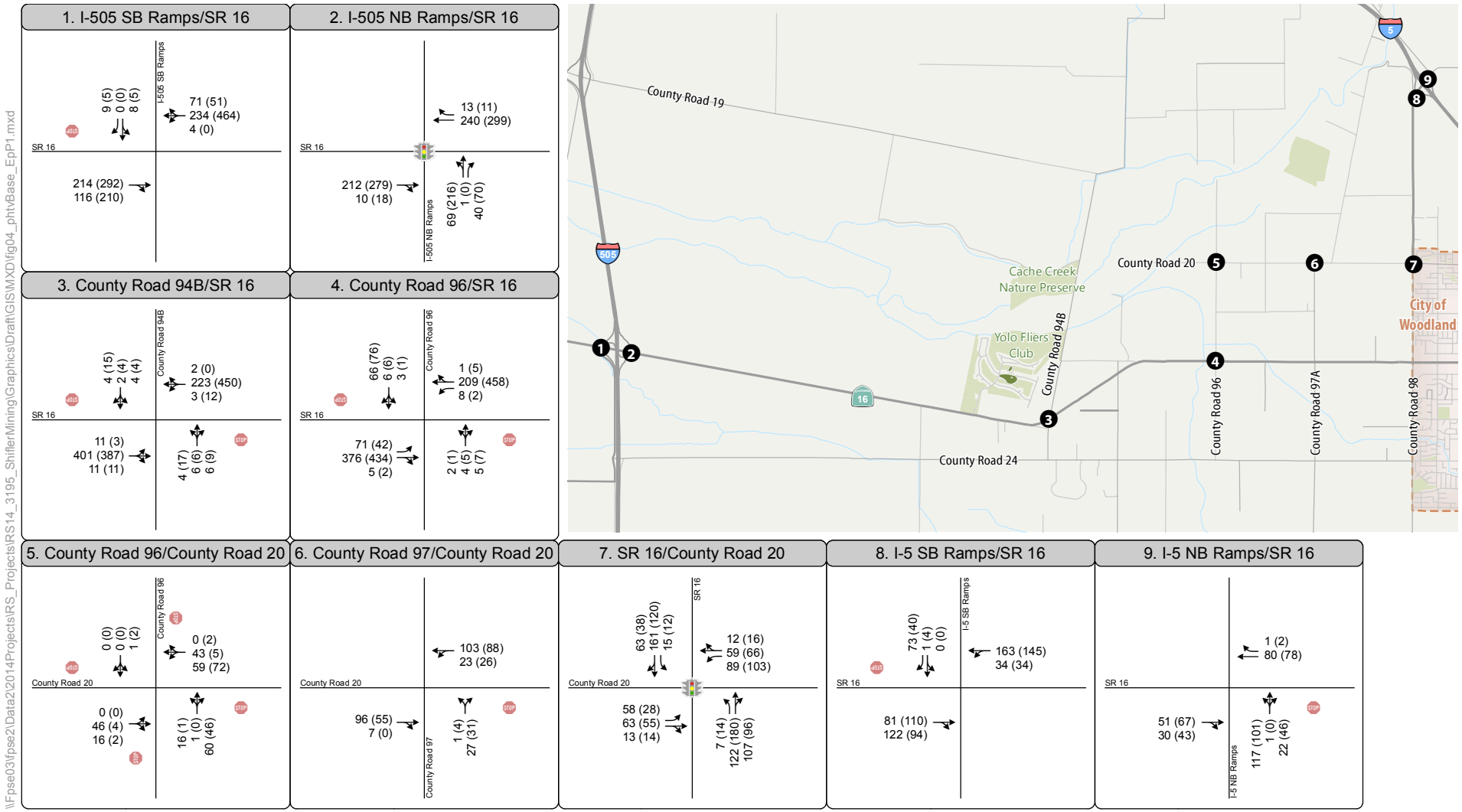
The proposed project consists of a mining site located adjacent to an existing aggregate plant (referred to as the Woodland Plant) in Yolo County west of Woodland. The Woodland Plant is permitted to produce up to 1.2 million tons of aggregate per year. In addition to the Woodland Plant, the Esparto Plant located north of Esparto in Yolo County (approximately 13 miles west of the Woodland Plant) has a maximum permitted production allotment of 1 million tons per year.

As part of the proposed project, Teichert is considering shifting some or all of their 1 million tons per year allotment from the Esparto Plant to the Woodland Plant, allowing production at the Woodland Plant to reach up to 2.2 million tons in a given year. The following four scenarios were analyzed to determine potential impacts of the proposed project:

- Scenario 1: Production of 1.2 million tons per year at the Woodland Plant (existing permitted maximum)
- Scenario 2: Production of 1.5 million tons per year at the Woodland Plant (existing permitted maximum plus 300,000 tons per year of existing permitted Estparto Plant volume)
- Scenario 3: Production of 1.8 million tons per year at the Woodland Plant (existing permitted maximum plus 600,000 tons per year of existing permitted Estparto Plant volume)
- Scenario 4: Production of 2.2 million tons per year at the Woodland Plant (existing permitted maximum plus 1 million tons per year of existing permitted Estparto Plant volume)

EXISTING PLUS PROJECT TRAFFIC VOLUMES

Project generated traffic volumes were added to existing traffic volumes for the existing plus project conditions peak hour operations analysis. To prevent double counting of truck trips, existing trips to and from the Woodland Plant were subtracted from the existing traffic volumes prior to adding anticipated traffic based on each production scenario.



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Turn Lane

AM (PM) Peak Hour Traffic Volume

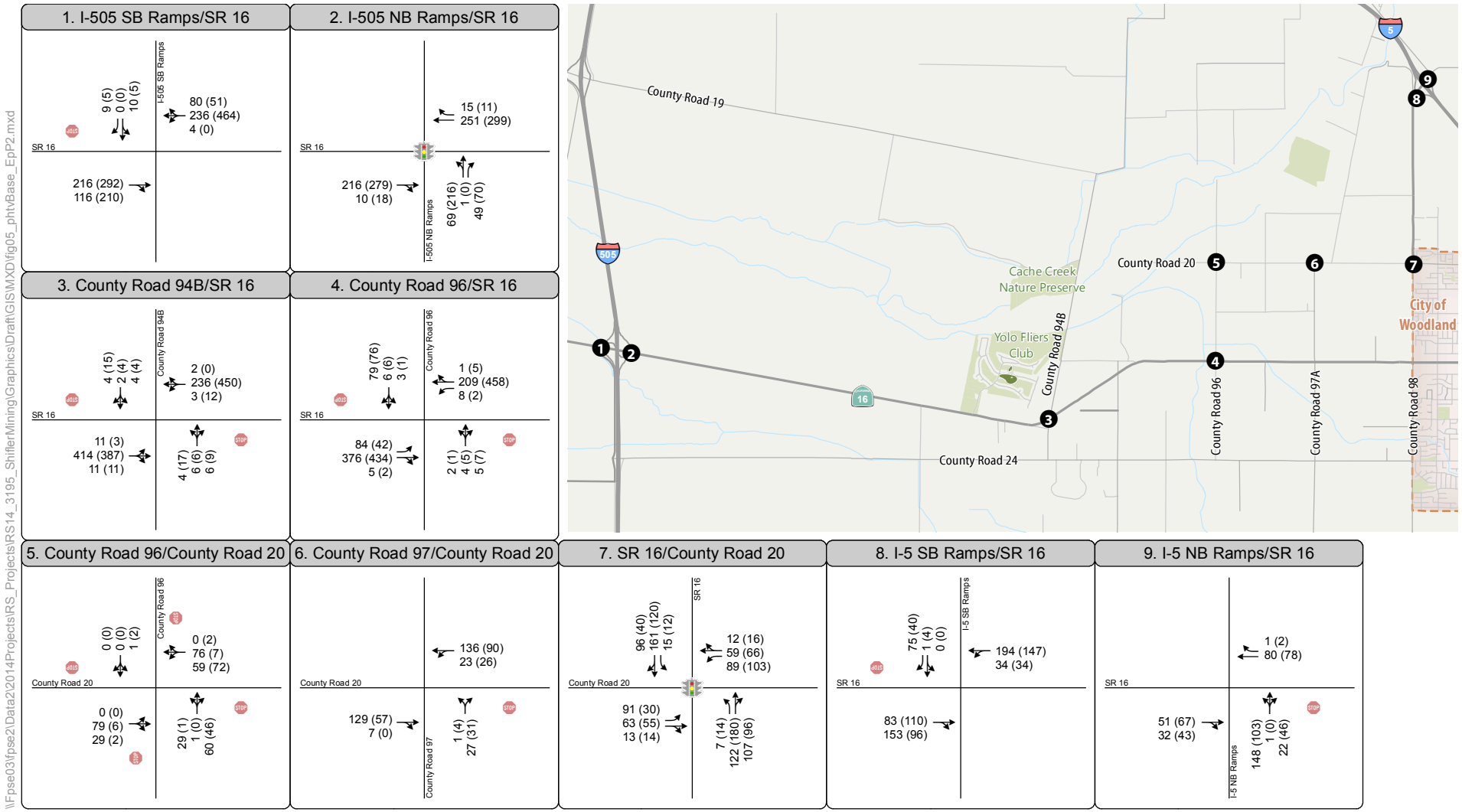
1 Study Intersection

Traffic Signal

Stop Sign

Figure 4

Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Project Conditions (Scenario 1)



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Turn Lane

AM (PM) Peak Hour Traffic Volume

❶ Study Intersection

Traffic Signal

Stop Sign

Figure 5

Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Project Conditions (Scenario 4)

EXISTING PLUS PROJECT INTERSECTION OPERATIONS

SCENARIO 1 – 1.2 MILLION TONS PER YEAR

Table 13 shows the existing plus project conditions intersection LOS analysis results for Scenario 1 (1.2 million tons per year). The technical calculations are provided in Appendix B.

TABLE 13 INTERSECTION LEVEL OF SERVICE – EXISTING PLUS SCENARIO 1

Intersection	Control	Existing				Existing Plus Scenario 1			
		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. SR 16/I-505 Southbound Ramps	Side Street Stop	1 (15)	A (B)	1 (20)	A (C)	1 (15)	A (B)	1 (20)	A (C)
2. SR 16/I-505 Northbound Ramps	Traffic Signal	6	A	7	A	6	A	7	A
3. SR 16/County Road 94B	Side Street Stop	1 (16)	A (C)	2 (22)	A (C)	1 (17)	A (C)	2 (22)	A (C)
4. SR 16/County Road 96	Side Street Stop	2 (17)	A (C)	2 (18)	A (C)	2 (18)	A (C)	2 (19)	A (C)
5. County Road 20/County Road 96	All Way Stop	7	A	7	A	9	A	8	A
6. County Road 20/County Road 97	Side Street Stop	2 (9)	A (A)	3 (9)	A (A)	2 (9)	A (A)	3 (9)	A (A)
7. County Road 20/SR 16 (County Road 98)	Traffic Signal	15	B	15	B	16	B	15	B
8. SR 16/Interstate 5 (I-5) Southbound Ramps	Side Street Stop	3 (12)	A (B)	2 (15)	A (B)	3 (13)	A (B)	2 (15)	A (B)
9. SR 16/I-5 Northbound Ramps	Side Street Stop	4 (10)	A (A)	5 (10)	A (B)	5 (11)	A (A)	5 (10)	A (B)

Notes: [1] For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for the overall intersection. For unsignalized (side street stop controlled) intersections, average intersection delay is reported in seconds per vehicle for the overall intersection (worst movement). All results are rounded to the nearest second.

Bold indicates unacceptable operations.

Source: Fehr & Peers, 2015

As shown in Table 13, the study intersections are expected to operate at acceptable levels with a production level of 1.2 million tons at the Woodland Plant.

SCENARIO 4 – 2.2 MILLION TONS PER YEAR

Table 14 shows the existing plus project conditions intersection LOS analysis results for Scenario 4 (2.2 million tons per year). The technical calculations are provided in Appendix B.

TABLE 14 INTERSECTION LEVEL OF SERVICE – EXISTING PLUS SCENARIO 4

Intersection	Control	Existing				Existing Plus Scenario 4			
		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. SR 16/I-505 Southbound Ramps	Side Street Stop	1 (15)	A (B)	1 (20)	A (C)	1 (16)	A (C)	1 (20)	A (C)
2. SR 16/I-505 Northbound Ramps	Traffic Signal	6	A	7	A	6	A	7	A
3. SR 16/County Road 94B	Side Street Stop	1 (16)	A (C)	2 (22)	A (C)	1 (18)	A (C)	2 (22)	A (C)
4. SR 16/County Road 96	Side Street Stop	2 (17)	A (C)	2 (18)	A (C)	3 (19)	A (C)	2 (19)	A (C)
5. County Road 20/County Road 96	All Way Stop	7	A	7	A	10	A	8	A
6. County Road 20/County Road 97	Side Street Stop	2 (9)	A (A)	3 (9)	A (A)	1 (10)	A (A)	3 (9)	A (A)
7. County Road 20/SR 16 (County Road 98)	Traffic Signal	15	B	15	B	17	B	15	B
8. SR 16/Interstate 5 (I-5) Southbound Ramps	Side Street Stop	3 (12)	A (B)	2 (15)	A (B)	2 (13)	A (B)	2 (15)	A (B)
9. SR 16/I-5 Northbound Ramps	Side Street Stop	4 (10)	A (A)	5 (10)	A (B)	6 (11)	A (B)	5 (10)	A (B)

Notes: [1] For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for the overall intersection. For unsignalized (side street stop controlled) intersections, average intersection delay is reported in seconds per vehicle for the overall intersection (worst movement). All results are rounded to the nearest second.

Bold indicates unacceptable operations.

Source: Fehr & Peers, 2015

As shown in Table 14, the study intersections are expected to operate at acceptable levels with a production level of 2.2 million tons at the Woodland Plant.

SCENARIOS 2 (1.5 MILLION TONS PER YEAR) AND 3 (1.8 MILLION TONS PER YEAR)

The Scenario 4 intersection level of service results show that the study intersections are expected to operate at acceptable levels of service with project traffic generated by the production of 2.2 million tons

of aggregate per year. Scenarios 2 and 3 will generate less traffic than Scenario 4, and therefore will also result in acceptable levels of service at the study intersections.

EXISITNG PLUS PROJECT ROADWAY SEGMENT OPERATIONS

SCENARIO 1 – 1.2 MILLION TONS PER YEAR

Table 15 shows the existing plus project peak hour roadway segment LOS results for the study roadway segments. The technical calculations are provided in Appendix C.

TABLE 15 ROADWAY SEGMENT LEVEL OF SERVICE – EXISTING PLUS SCENARIO 1

Roadway - Location	Roadway Classification[1]	AM Peak Hour			PM Peak Hour		
		ATS (mph)[2]	PTSF (%)[3]	LOS	ATS (mph)	PTSF (%)	LOS
SR 16 – I-505 to County Road 94B	Class I Highway	EB – 44.0 WB – 44.6	EB – 70.1 WB – 48.8	D D	EB – 42.9 WB – 43.7	EB – 65.6 WB – 68.3	D D
SR 16 – County Road 94B to County Road 96	Class I Highway	EB – 43.7 WB – 44.3	EB – 68.6 WB – 49.3	D D	EB – 41.7 WB – 42.4	EB – 70.4 WB – 72.5	D D
County Road 96 – County Road 20 to SR 16	Class II Highway	NA[2]	NB – 31.4 SB – 25.5	A A	NA[2]	NB – 16.2 SB – 34.4	A A
County Road 20 – West of County Road 96	Class II Highway	NA[2]	EB – 23.7 WB – 31.8	A A	NA[2]	EB – 13.7 WB – 14.7	A A
County Road 20 – County Road 96 to County Road 98	Class II Highway	NA[2]	EB – 40.0 WB – 42.3	A B	NA[2]	EB – 31.1 WB – 33.2	A A
SR 16 (County Road 98) – County Road 20 to I-5	Class II Highway	NB – 46.9 SB – 46.6	NB – 45.7 SB – 54.2	C C	NB – 47.4 SB – 47.6	NB – 48.9 SB – 44.3	C C

Notes: [1] Based on *Highway Capacity 2010*
[2] Average Travel Speed (ATS) is only reported for Class I Highways based on HCM 2010 methodology
[3] PTSF = Percent Time Spent Following
Source: Fehr & Peers, 2015

As shown in Table 15, the study roadway segments are expected to operate at acceptable levels of service with Scenario 1.

SCENARIO 4 – 2.2 MILLION TONS PER YEAR

Table 16 shows the existing plus project peak hour roadway segment LOS results for the study roadway segments. The technical calculations are provided in Appendix C.

TABLE 16 ROADWAY SEGMENT LEVEL OF SERVICE – EXISTING PLUS SCENARIO 4

Roadway - Location	Roadway Classification[1]	AM Peak Hour			PM Peak Hour		
		ATS (mph)[2]	PTSF (%)[3]	LOS	ATS (mph)	PTSF (%)	LOS
SR 16 – I-505 to County Road 94B	Class I Highway	EB – 43.7 WB – 44.3	EB – 71.6 WB – 49.6	D D	EB – 42.9 WB – 43.7	EB – 65.6 WB – 68.3	D D
SR 16 – County Road 94B to County Road 96	Class I Highway	EB – 43.4 WB – 44.1	EB – 68.4 WB – 51.1	D D	EB – 41.7 WB – 42.4	EB – 70.4 WB – 72.5	D D
County Road 96 – County Road 20 to SR 16	Class II Highway	NA[2]	NB – 34.6 SB – 28.3	A A	NA[2]	NB – 16.2 SB – 34.4	A A
County Road 20 – West of County Road 96	Class II Highway	NA[2]	EB – 34.8 WB – 46.9	A B	NA[2]	EB – 14.3 WB – 15.3	A A
County Road 20 – County Road 96 to County Road 98	Class II Highway	NA[2]	EB – 45.3 WB – 48.1	B B	NA[2]	EB – 31.5 WB – 33.4	A A
SR 16 (County Road 98) – County Road 20 to I-5	Class II Highway	NB – 46.2 SB – 45.8	NB – 50.5 SB – 58.1	C C	NB – 47.3 SB – 47.5	NB – 48.9 SB – 44.4	C C

Notes: [1] Based on *Highway Capacity 2010*
[2] Average Travel Speed (ATS) is only reported for Class I Highways based on HCM 2010 methodology
[3] PTSF = Percent Time Spent Following
Source: Fehr & Peers, 2015

As shown in Table 16, the study roadway segments are expected to operate at acceptable levels of service with Scenario 4.

SCENARIOS 2 (1.5 MILLION TONS PER YEAR) AND 3 (1.8 MILLION TONS PER YEAR)

The Scenario 4 roadway segment level of service results show that the study roadway segments are expected to operate at acceptable levels of service with project traffic generated by the production of 2.2 million tons of aggregate per year. Scenarios 2 and 3 will generate less traffic than Scenario 4, and therefore will also result in acceptable levels of service on the study roadways.

EXISTING PLUS PROJECT ROADWAY SEGMENT CAPACITY ANALYSIS

SCENARIO 1 – 1.2 MILLION TONS PER YEAR

Table 17 shows the existing plus project peak hour roadway segment capacity analysis results for the study roadway segments.

TABLE 17 ROADWAY SEGMENT CAPACITY ANALYSIS – EXISTING PLUS SCENARIO 1						
Roadway - Location	**Roadway Classification[1]**	**Number of Lanes**	**AM Peak Hour**		**PM Peak Hour**	
			One-Way Volume	**LOS**	**One-Way Volume**	**LOS**
SR 16 – I-505 to County Road 94B	Conventional Two-Lane Highway	2	EB – 422 WB – 230	C B	EB – 401 WB – 482	C C
SR 16 – County Road 94B to County Road 96	Conventional Two-Lane Highway	2	EB – 451 WB – 276	C B	EB – 478 WB – 535	C C
County Road 96 – County Road 20 to SR 16	Local Roadway	2	NB - 81 SB – 74	NA NA	NB - 46 SB – 90	NA NA
County Road 20 – West of County Road 96	Local Roadway	2	EB – 62 WB – 60	NA NA	EB – 6 WB – 6	NA NA
County Road 20 – County Road 96 to County Road 98	Local Roadway	2	EB – 138 WB – 126	NA NA	EB – 97 WB – 118	NA NA
SR 16 (County Road 98) – County Road 20 to I-5	Conventional Two-Lane Highway	2	NB – 202 SB – 235	B B	NB – 204 SB – 185	B B

Notes: [1] Based on *Yolo County 2030 Countywide General Plan*
NA – The General Plan does not provide capacity thresholds for Local Roadways.
Source: Fehr & Peers, 2015

As shown in Table 17, the study roadway segments are expected to operate at acceptable levels of service with Scenario 1.

SCENARIO 4 – 2.2 MILLION TONS PER YEAR

Table 18 shows the existing plus project peak hour roadway segment capacity analysis results for the study roadway segments.

TABLE 18 ROADWAY SEGMENT CAPACITY ANALYSIS – EXISTING PLUS SCENARIO 4						
Roadway - Location	**Roadway Classification[1]**	**Number of Lanes**	**AM Peak Hour**		**PM Peak Hour**	
			One-Way Volume	**LOS**	**One-Way Volume**	**LOS**
SR 16 – I-505 to County Road 94B	Conventional Two-Lane Highway	2	EB – 435 WB – 243	C B	EB – 401 WB – 482	C C
SR 16 – County Road 94B to County Road 96	Conventional Two-Lane Highway	2	EB – 464 WB – 289	C B	EB – 478 WB – 535	C C
County Road 96 – County Road 20 to SR 16	Local Roadway	2	NB - 94 SB – 87	NA NA	NB - 46 SB – 90	NA NA
County Road 20 – West of County Road 96	Local Roadway	2	EB – 108 WB – 106	NA NA	EB – 8 WB – 8	NA NA
County Road 20 – County Road 96 to County Road 98	Local Roadway	2	EB – 171 WB – 159	NA NA	EB – 99 WB – 120	NA NA
SR 16 (County Road 98) – County Road 20 to I-5	Conventional Two-Lane Highway	2	NB – 235 SB – 268	B B	NB – 206 SB – 187	B B

Notes: [1] Based on *Yolo County 2030 Countywide General Plan*
NA – The General Plan does not provide capacity thresholds for Local Roadways.
Source: Fehr & Peers, 2015

As shown in Table 18, the study roadway segments are expected to operate at acceptable levels of service with Scenario 4.

SCENARIOS 2 (1.5 MILLION TONS PER YEAR) AND 3 (1.8 MILLION TONS PER YEAR)

The Scenario 4 roadway segment capacity analysis results show that the study roadway segments are expected to operate at acceptable levels of service with project traffic generated by the production of 2.2 million tons of aggregate per year. Scenarios 2 and 3 will generate less traffic than Scenario 4, and therefore will also result in acceptable levels of service on the study roadways.

EXISTING PLUS PROJECT FREEWAY OPERATIONS

SCENARIO 1 – 1.2 MILLION TONS PER YEAR

Table 19 shows the existing plus project conditions peak hour freeway segment (including basic, merge, and diverge sections) LOS analysis results for Scenario 1 (1.2 million tons per year). The technical calculations are provided in Appendix D.

TABLE 19 FREEWAY LEVEL OF SERVICE – EXISTING PLUS SCENARIO 1

Freeway - 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
I-5 Northbound	South of SR 16	Basic	0.19	6.4	A	0.20	6.9	A
	SR 16 Off-Ramp	Diverge	0.20	10.7	B	0.22	11.3	B
	SR 16 Loop On-Ramp	Merge	0.16	10.1	B	0.18	10.7	B
	SR 16 On-Ramp	Merge	0.16	9.3	A	0.18	10.0	A
	North of SR 16	Basic	0.16	5.4	A	0.18	6.0	A
I-5 Southbound	North of SR 16	Basic	0.16	5.4	A	0.18	6.1	A
	SR 16 Off-Ramp	Diverge	0.17	9.0	A	0.19	9.9	A
	SR 16 On-Ramp	Merge	0.19	10.4	B	0.21	11.2	B
	South of SR 16	Basic	0.18	6.1	A	0.20	6.8	A
I-505 Northbound	South of SR 16	Basic	0.07	2.3	A	0.11	3.6	A
	SR 16 Off-Ramp	Diverge	0.07	5.5	A	0.12	7.1	A
	SR 16 Loop On-Ramp	Merge	0.05	5.7	A	0.05	5.7	A
	SR 16 On-Ramp	Merge	0.05	6.1	A	0.05	6.1	A
	North of SR 16	Basic	0.05	1.6	A	0.05	1.6	A
I-505 Southbound	North of SR 16	Basic	0.05	1.6	A	0.05	1.6	A
	SR 16 Off-Ramp	Diverge	0.05	4.9	A	0.05	4.9	A
	SR 16 Loop On-Ramp	Merge	0.06	5.9	A	0.06	5.7	A
	SR 16 On-Ramp	Merge	0.09	6.9	A	0.11	7.6	A
	South of SR 16	Basic	0.09	3.1	A	0.11	3.7	A

Notes: [1] v/c Ratio = volume-to-capacity ratio
[2] pcplpm = passenger cars per lane per mile
Source: Fehr & Peers, 2015

As shown in Table 19, the study freeway facilities are expected to operate at acceptable levels of service with Scenario 1.

SCENARIO 4 – 2.2 MILLION TONS PER YEAR

Table 20 shows the existing plus project conditions peak hour freeway segment (including basic, merge, and diverge sections) LOS analysis results for Scenario 4 (2.2 million tons per year). The technical calculations are provided in Appendix D.

TABLE 20 FREEWAY LEVEL OF SERVICE – EXISTING PLUS SCENARIO 4

Freeway - 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
I-5 Northbound	South of SR 16	Basic	0.20	6.7	A	0.20	6.9	A
	SR 16 Off-Ramp	Diverge	0.21	11.1	B	0.22	11.3	B
	SR 16 Loop On-Ramp	Merge	0.16	10.1	B	0.18	10.7	B
	SR 16 On-Ramp	Merge	0.16	9.3	A	0.18	10.0	A
	North of SR 16	Basic	0.16	5.4	A	0.18	6.0	A
I-5 Southbound	North of SR 16	Basic	0.16	5.4	A	0.18	6.1	A
	SR 16 Off-Ramp	Diverge	0.17	9.1	A	0.19	9.9	A
	SR 16 On-Ramp	Merge	0.19	10.7	B	0.21	11.2	B
	South of SR 16	Basic	0.19	6.4	A	0.20	6.8	A
I-505 Northbound	South of SR 16	Basic	0.07	2.4	A	0.11	3.6	A
	SR 16 Off-Ramp	Diverge	0.08	5.6	A	0.12	7.1	A
	SR 16 Loop On-Ramp	Merge	0.05	5.7	A	0.05	5.7	A
	SR 16 On-Ramp	Merge	0.05	6.1	A	0.05	6.1	A
	North of SR 16	Basic	0.05	1.6	A	0.05	1.6	A
I-505 Southbound	North of SR 16	Basic	0.05	1.6	A	0.05	1.6	A
	SR 16 Off-Ramp	Diverge	0.05	4.9	A	0.05	4.9	A
	SR 16 Loop On-Ramp	Merge	0.06	5.9	A	0.06	5.7	A
	SR 16 On-Ramp	Merge	0.10	7.0	A	0.11	7.6	A
	South of SR 16	Basic	0.09	3.2	A	0.11	3.7	A

Notes: [1] v/c Ratio = volume-to-capacity ratio
[2] pcplpm = passenger cars per lane per mile
Source: Fehr & Peers, 2015

As shown in Table 20, the study freeway facilities are expected to operate at acceptable levels of service with Scenario 4.

SCENARIOS 2 (1.5 MILLION TONS PER YEAR) AND 3 (1.8 MILLION TONS PER YEAR)

The Scenario 4 freeway segment level of service results show that the study freeway facilities are expected to operate at acceptable levels of service with project traffic generated by the production of 2.2 million

tons of aggregate per year. Scenarios 2 and 3 will generate less traffic than Scenario 4, and therefore will also result in acceptable levels of service on the freeway facilities.

CUMULATIVE BASELINE CONDITIONS

The cumulative baseline conditions analysis assumes that the Woodland and Esparto Plants will be operating at full capacity (1.2 MTY production at Woodland and 1 MTY production at Esparto) based on allowed production allotments, which is the same as the Scenario 1 analysis.

CUMULATIVE BASELINE TRAFFIC VOLUMES

Cumulative baseline conditions traffic volumes were developed using a modified version of the SACMET regional travel demand model developed by the Sacramento Area Council of Governments (SACOG) for the Metropolitan Transportation Plan (MTP)/Sustainable Communities Strategy (SCS) update. Four primary steps were taken to develop future year volumes – subarea model updates, static validation, dynamic validation, difference method analysis.

The cumulative baseline conditions traffic volumes include traffic volumes generated by 1.2 MTY and 1 MTY of production at the Woodland and Esparto Plants, respectively, representing the current permitted annual maximums for each facility. The Woodland and Esparto traffic volumes were added to the cumulative conditions traffic volumes developed from the SACMET model.

Subarea Model Updates

Modifications to the SACMET model were made to improve accuracy, and included:

- Updates to the roadway network to include greater detail within the study area
- Additional traffic analysis zone (TAZ) detail including new TAZ's in the study area to improve the loading of traffic onto the transportation network

Static Validation

Static validation tests compare a model's base year traffic volume estimates to traffic counts using the following statistical measures:

- Volume-to-Count Ratio – is computed by dividing the volume assigned by the model and the actual traffic count for individual roadways.
- Percent of Links within Caltrans Deviation Allowance – the deviation is the difference between the model volume and the actual count divided by the actual count.

- Correlation Coefficient – estimates the correlation between the actual traffic counts and the estimated traffic volumes from the model.
- Percent Root Mean Square Error (RMSE) – is the square root of the model volume minus the actual count squared divided by the number of counts. It is a measure similar to standard deviation in that it assesses the accuracy of the entire model.

Dynamic Validation

Dynamic validation involves making changes to transportation network or the quantity of a particular land use type, and comparing the magnitude and direction of change from the original forecast. The following dynamic validation tests were completed for this analysis:

- Add a new roadway segment
- Remove a roadway segment
- Add 10, 100, and 1000 households to a TAZ

Difference Method Analysis

A difference method analysis was performed, which takes the difference between future year and base year traffic volumes from the model and adds them to existing traffic counts at the study intersections to develop future year forecasts. This method corrects any potential anomalies within the model and assures an accurate estimation of future year traffic volumes.

CUMULATIVE BASELINE INTERSECTION OPERATIONS

Cumulative baseline conditions intersection delay and LOS were calculated for the study intersections using Synchro 8 software, which utilizes *HCM 2010* methodology. The cumulative peak hour traffic volumes, intersection lane configurations, and traffic controls are shown on Figure 6. Table 21 shows the cumulative baseline conditions delay and LOS results at the study intersections. The technical calculations are provided in Appendix B.

TABLE 21 INTERSECTION LEVEL OF SERVICE – CUMULATIVE BASELINE CONDITIONS

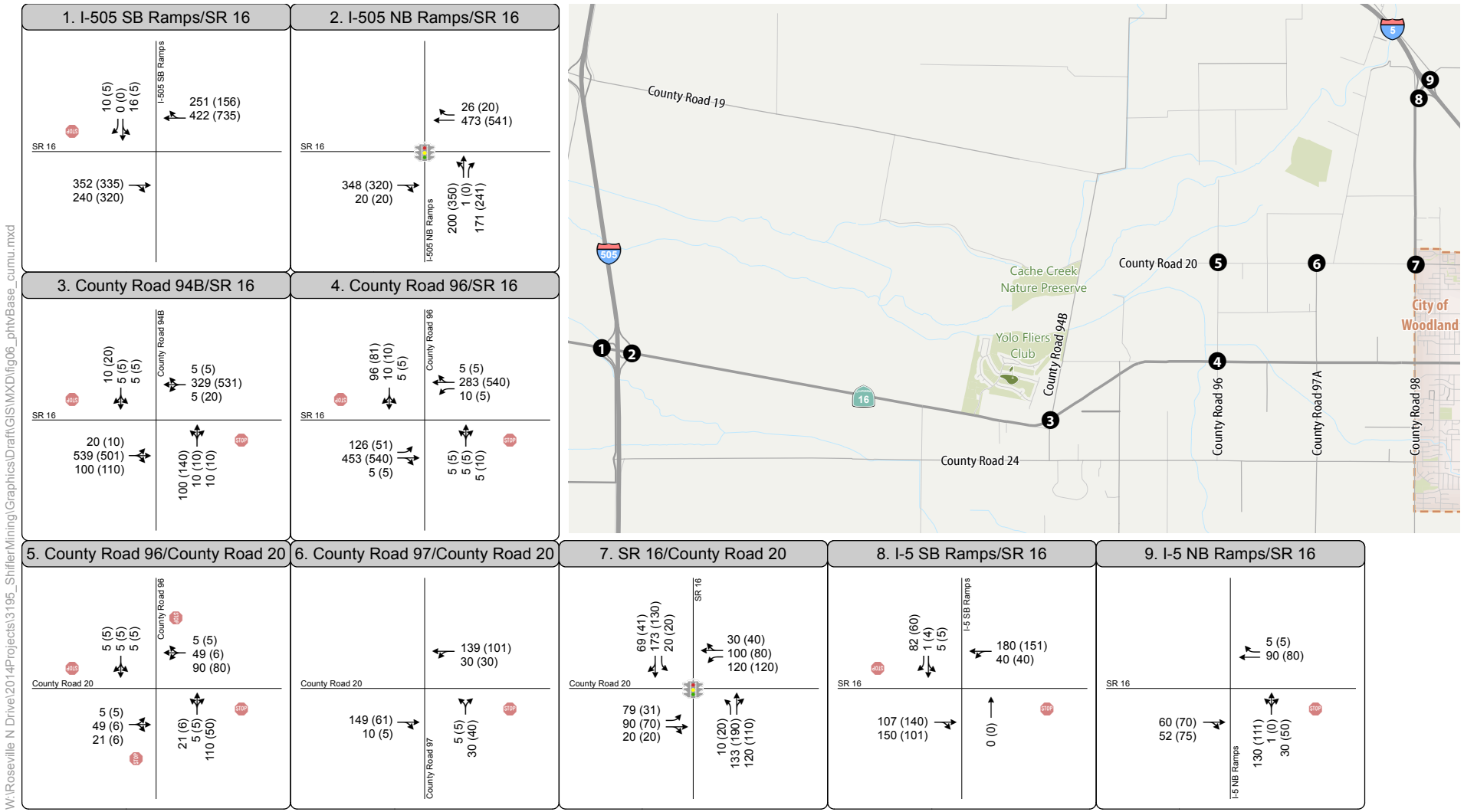
Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS	Delay[1]	LOS
1. SR 16/I-505 Southbound Ramps	Side Street Stop	1 (25)	A (D)	1 (34)	A (D)
2. SR 16/I-505 Northbound Ramps	Traffic Signal	8	A	9	A
3. SR 16/County Road 94B	Side Street Stop	8 **(69)**	A **(F)**	33 **(268)**	D **(F)**
4. SR 16/County Road 96	Side Street Stop	3 (34)	A (D)	2 (27)	A (D)
5. County Road 20/County Road 96	All Way Stop	9	A	8	A
6. County Road 20/County Road 97	Side Street Stop	2 (10)	A (A)	3 (9)	A (A)
7. County Road 20/SR 16 (County Road 98)	Traffic Signal	17	B	16	B
8. SR 16/Interstate 5 (I-5) Southbound Ramps	Side Street Stop	2 (13)	A (B)	2 (14)	A (B)
9. SR 16/I-5 Northbound Ramps	Side Street Stop	6 (11)	A (B)	5 (10)	A (B)

Notes: [1] For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for the overall intersection. For unsignalized (side street stop controlled) intersections, average intersection delay is reported in seconds per vehicle for the overall intersection (worst movement). All results are rounded to the nearest second.

Bold indicates unacceptable operations.

Source: Fehr & Peers, 2015

As shown in Table 21, the side street approach of the SR 16/County Road 94B intersection is expected to operate at LOS F during the AM and PM peak hours under cumulative baseline conditions. The remaining study intersections are expected to operate at acceptable levels of service under cumulative baseline conditions.



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Turn Lane

AM (PM) Peak Hour Traffic Volume

1 Study Intersection

Traffic Signal

Stop Sign

Figure 6

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Baseline Conditions

CUMULATIVE BASELINE ROADWAY SEGMENT OPERATIONS

Cumulative baseline conditions peak hour roadway segment operations analysis was performed using Highway Capacity Software (HCS) 2010 which utilizes *HCM 2010* methodology. LOS was determined by comparing the resulting Percent Time Spent Following (PTSF) to the thresholds provided in Table 2. Table 22 shows the LOS results for the study roadway segments.

TABLE 22 ROADWAY SEGMENT LEVEL OF SERVICE – CUMULATIVE BASELINE CONDITIONS

Roadway - Location	Roadway Classification[1]	AM Peak Hour			PM Peak Hour		
		ATS (mph)[2]	PTSF (%)[3]	LOS	ATS (mph)[2]	PTSF (%)[3]	LOS
SR 16 – I-505 to County Road 94B	Class I Highway	EB – 41.4 WB – 42.0	EB – 79.2 WB – 64.2	D D	EB – 40.2 WB – 40.9	EB – 75.7 WB – 77.0	D D
SR 16 – County Road 94B to County Road 96	Class I Highway	EB – 41.9 WB – 42.8	EB – 75.6 WB – 58.7	D D	EB – 40.5 WB – 41.1	EB – 74.9 WB – 75.3	D D
County Road 96 – County Road 20 to SR 16	Class II Highway	NA[2]	NB – 43.8 SB – 33.3	B A	NA[2]	NB – 18.9 SB – 38.1	A A
County Road 20 – West of County Road 96	Class II Highway	NA[2]	EB – 26.0 WB – 40.3	A B	NA[2]	EB – 19.1 WB – 14.2	A A
County Road 20 – County Road 96 to County Road 98	Class II Highway	NA[2]	EB – 47.5 WB – 51.0	B B	NA[2]	EB – 32.6 WB – 36.7	A A
SR 16 (County Road 98) – County Road 20 to I-5	Class II Highway	NB – 46.3 SB – 46.2	NB – 52.9 SB – 55.2	C C	NB – 46.9 SB – 47.1	NB – 52.6 SB – 47.5	C C

Notes: [1] Based on *Highway Capacity 2010*
[2] Average Travel Speed (ATS) is only reported for Class I Highways based on HCM 2010 methodology
[3] PTSF = Percent Time Spent Following
Source: Fehr & Peers, 2015

As shown in Table 22, the study roadway segments are expected to operate at acceptable levels of service during the weekday AM and PM peak hours under cumulative baseline conditions.

CUMULATIVE BASELINE ROADWAY SEGMENT CAPACITY ANALYSIS

Cumulative baseline conditions peak hour roadway segment capacity analysis was performed using the Peak Hour Level of Service Thresholds for Roadway Segments table in the Yolo County *2030 Countywide General Plan EIR* (April 2009), shown in Table 3. The LOS traffic volume thresholds are based on facility

type and number of lanes. Table 23 shows the cumulative baseline conditions peak hour roadway segment LOS capacity analysis results.

TABLE 23 ROADWAY SEGMENT CAPACITY ANLAYSIS – CUMULATIVE BASELINE CONDITIONS

Roadway - Location	Roadway Classification[1]	Number of Lanes	AM Peak Hour		PM Peak Hour	
			One-Way Volume	LOS	One-Way Volume	LOS
SR 16 – I-505 to County Road 94B	Conventional Two-Lane Highway	2	EB – 659 WB – 439	C C	EB – 621 WB – 691	C C
SR 16 – County Road 94B to County Road 96	Conventional Two-Lane Highway	2	EB – 584 WB – 384	C C	EB – 596 WB – 626	C C
County Road 96 – County Road 20 to SR 16	Local Roadway	2	NB - 136 SB – 116	NA NA	NB - 61 SB – 111	NA NA
County Road 20 – West of County Road 96	Local Roadway	2	EB – 75 WB – 85	NA NA	EB – 17 WB – 12	NA NA
County Road 20 – County Road 96 to County Road 98	Local Roadway	2	EB – 189 WB – 179	NA NA	EB – 121 WB – 141	NA NA
SR 16 (County Road 98) – County Road 20 to I-5	Conventional Two-Lane Highway	2	NB – 257 SB – 262	B B	NB – 241 SB – 211	B B

Notes: [1] Based on *Yolo County 2030 Countywide General Plan*
NA – The General Plan does not provide capacity thresholds for Local Roadways.
Source: Fehr & Peers, 2015

As shown in Table 23, the study roadway segments are expected to operate at acceptable levels of service under cumulative baseline conditions.

CUMULATIVE BASELINE FREEWAY OPERATIONS

Cumulative baseline conditions peak hour freeway segment analysis was performed based on *HCM 2010* methodology. Table 24 shows the peak hour freeway segment LOS results for the basic, merge, and diverge segments on I-5 at SR 16 and on I-505 at SR 16.

TABLE 24 FREEWAY LEVEL OF SERVICE – CUMULATIVE BASELINE CONDITIONS

Freeway - 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
I-5 Northbound	South of SR 16	Basic	0.36	12.4	B	0.32	11.1	B
	SR 16 Off-Ramp	Diverge	0.40	18.0	B	0.35	16.3	B
	SR 16 Loop On-Ramp	Merge	0.35	16.7	B	0.32	15.5	B
	SR 16 On-Ramp	Merge	0.35	15.9	B	0.32	14.8	B
	North of SR 16	Basic	0.33	11.4	B	0.30	10.4	A
I-5 Southbound	North of SR 16	Basic	0.29	10.1	A	0.35	11.9	B
	SR 16 Off-Ramp	Diverge	0.32	14.7	B	0.38	16.8	B
	SR 16 On-Ramp	Merge	0.33	15.8	B	0.38	17.4	B
	South of SR 16	Basic	0.32	11.0	B	0.36	12.5	B
I-505 Northbound	South of SR 16	Basic	0.24	8.2	A	0.25	8.6	A
	SR 16 Off-Ramp	Diverge	0.26	12.7	B	0.27	13.0	B
	SR 16 Loop On-Ramp	Merge	0.16	9.9	A	0.12	8.5	A
	SR 16 On-Ramp	Merge	0.17	10.4	B	0.13	8.9	A
	North of SR 16	Basic	0.16	5.5	A	0.12	4.2	A
I-505 Southbound	North of SR 16	Basic	0.16	5.6	A	0.14	4.8	A
	SR 16 Off-Ramp	Diverge	0.18	9.7	A	0.15	8.7	A
	SR 16 Loop On-Ramp	Merge	0.23	11.7	B	0.18	10.1	B
	SR 16 On-Ramp	Merge	0.29	14.0	B	0.26	13.0	B
	South of SR 16	Basic	0.28	9.6	A	0.25	8.7	A

Notes: [1] v/c Ratio = volume-to-capacity ratio
[2] pcplpm = passenger cars per lane per mile
Source: Fehr & Peers, 2015

As shown in Table 24, the study freeway facilities are expected to operate at acceptable levels of service during the weekday AM and PM peak hours under cumulative baseline conditions.

CUMULATIVE PLUS PROJECT CONDITIONS

In order to determine potential impacts of the proposed project, the results of the project analysis scenarios were compared to the cumulative baseline conditions (which is the same as the cumulative plus Scenario 1 conditions) analysis results. The following project scenarios were analyzed:

- Scenario 2: Production of 1.5 million tons per year at the Woodland Plant; 0.7 million tons per year at the Esparto Plant
- Scenario 3: Production of 1.8 million tons per year at the Woodland Plant; 0.4 million tons per year at the Esparto Plant
- Scenario 4: Production of 2.2 million tons per year at the Woodland Plant; 0 tons per year at the Esparto Plant

CUMULATIVE PLUS PROJECT TRAFFIC VOLUMES

Project generated traffic volumes were added to the cumulative no project conditions traffic volumes for the cumulative plus project conditions peak hour operations analysis.

CUMULATIVE PLUS PROJECT INTERSECTION OPERATIONS

SCENARIO 2 – 1.5 MTY FROM WOODLAND AND 0.7 MTY FROM ESPARTO

Table 25 shows the cumulative plus project conditions intersection LOS analysis results for Scenario 2 (1.5 million tons per year from Woodland; 0.7 million tons per year from Esparto). The technical calculations are provided in Appendix B.

TABLE 25 INTERSECTION LEVEL OF SERVICE – CUMULATIVE PLUS SCENARIO 2

Intersection	Control	Cumulative Baseline				Cumulative Plus Scenario 2			
		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. SR 16/I-505 Southbound Ramps	Side Street Stop	1 (25)	A (D)	1 (34)	A (D)	1 (25)	A (D)	1 (34)	A (D)
2. SR 16/I-505 Northbound Ramps	Traffic Signal	8	A	9	A	8	A	9	A
3. SR 16/County Road 94B	Side Street Stop	8 **(69)**	A **(F)**	33 **(268)**	D **(F)**	8 **(70)**	A **(F)**	33 **(268)**	D **(F)**
4. SR 16/County Road 96	Side Street Stop	3 (34)	A (D)	2 (27)	A (D)	4 **(36)**	A **(E)**	2 (27)	A (D)
5. County Road 20/County Road 96	All Way Stop	9	A	8	A	9	A	8	A
6. County Road 20/County Road 97	Side Street Stop	2 (10)	A (A)	3 (9)	A (A)	2 (10)	A (B)	3 (9)	A (A)
7. County Road 20/SR 16 (County Road 98)	Traffic Signal	17	B	16	B	17	B	16	B
8. SR 16/Interstate 5 (I-5) Southbound Ramps	Side Street Stop	2 (13)	A (B)	2 (14)	A (B)	2 (13)	A (B)	2 (14)	A (B)
9. SR 16/I-5 Northbound Ramps	Side Street Stop	6 (11)	A (B)	5 (10)	A (B)	6 (11)	A (B)	5 (10)	A (B)

Notes: [1] For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for the overall intersection. For unsignalized (side street stop controlled) intersections, average intersection delay is reported in seconds per vehicle for the overall intersection (worst movement). All results are rounded to the nearest second.

Bold indicates unacceptable operations.
Shaded indicates a significant impact.

Source: Fehr & Peers, 2015

As shown in Table 25, the SR 16/County Road 94B intersection is expected to operate at LOS F during the AM and PM peak hours; however, the project is not expected to add 10 or more vehicles to the intersection and therefore does not create a significant impact at the intersection. The SR 16/County Road 96 intersection is expected to degrade from LOS D (acceptable operations) to LOS E (unacceptable operations) during the AM peak hour under cumulative plus Scenario 2 conditions, creating a significant impact. The remaining study intersections are expected to operate at acceptable levels with a production level of 1.5 million tons at the Woodland Plant and 0.7 million tons at the Esparto Plant.

SCENARIO 3 – 1.8 MTY FROM WOODLAND AND 0.4 MTY FROM ESPARTO

Table 26 shows the cumulative plus project conditions intersection LOS analysis results for Scenario 3 (1.8 million tons per year from Woodland; 0.4 million tons per year from Esparto). The technical calculations are provided in Appendix B.

TABLE 26 INTERSECTION LEVEL OF SERVICE – CUMULATIVE PLUS SCENARIO 3

Intersection	Control	Cumulative				Cumulative Plus Scenario 3			
		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. SR 16/I-505 Southbound Ramps	Side Street Stop	1 (25)	A (D)	1 (34)	A (D)	1 (25)	A (D)	1 (34)	A (D)
2. SR 16/I-505 Northbound Ramps	Traffic Signal	8	A	9	A	8	A	9	A
3. SR 16/County Road 94B	Side Street Stop	8 **(69)**	A **(F)**	33 **(268)**	D **(F)**	8 **(72)**	A **(F)**	33 **(268)**	D **(F)**
4. SR 16/County Road 96	Side Street Stop	3 (34)	A (D)	2 (27)	A (D)	4 **(36)**	A **(E)**	2 (27)	A (D)
5. County Road 20/County Road 96	All Way Stop	9	A	8	A	9	A	8	A
6. County Road 20/County Road 97	Side Street Stop	2 (10)	A (A)	3 (9)	A (A)	1 (10)	A (B)	3 (9)	A (A)
7. County Road 20/SR 16 (County Road 98)	Traffic Signal	17	B	16	B	17	B	16	B
8. SR 16/Interstate 5 (I-5) Southbound Ramps	Side Street Stop	2 (13)	A (B)	2 (14)	A (B)	2 (13)	A (B)	2 (14)	A (B)
9. SR 16/I-5 Northbound Ramps	Side Street Stop	6 (11)	A (B)	5 (10)	A (B)	6 (11)	A (B)	5 (10)	A (B)

Notes: [1] For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for the overall intersection. All results are rounded to the nearest second.

Bold indicates unacceptable operations.

Shaded indicates a significant impact.

Source: Fehr & Peers, 2015

As shown in Table 26, the SR 16/County Road 94B intersection is expected to operate at LOS F during the AM and PM peak hours, and the project is expected to add 10 or more vehicles to the intersection creating a significant impact. The SR 16/County Road 96 intersection is expected to degrade from LOS D (acceptable operations) to LOS E (unacceptable operations) during the AM peak hour under cumulative plus Scenario 3 conditions, creating a significant impact. The remaining study intersections are expected

to operate at acceptable levels with a production level of 1.8 million tons at the Woodland Plant and 0.4 million tons at the Esparto Plant.

SCENARIO 4 – 2.2 MTY FROM WOODLAND

Table 27 shows the cumulative plus project conditions intersection LOS analysis results for Scenario 4 (2.2 million tons per year from Woodland; 0 tons per year from Esparto). The technical calculations are provided in Appendix B.

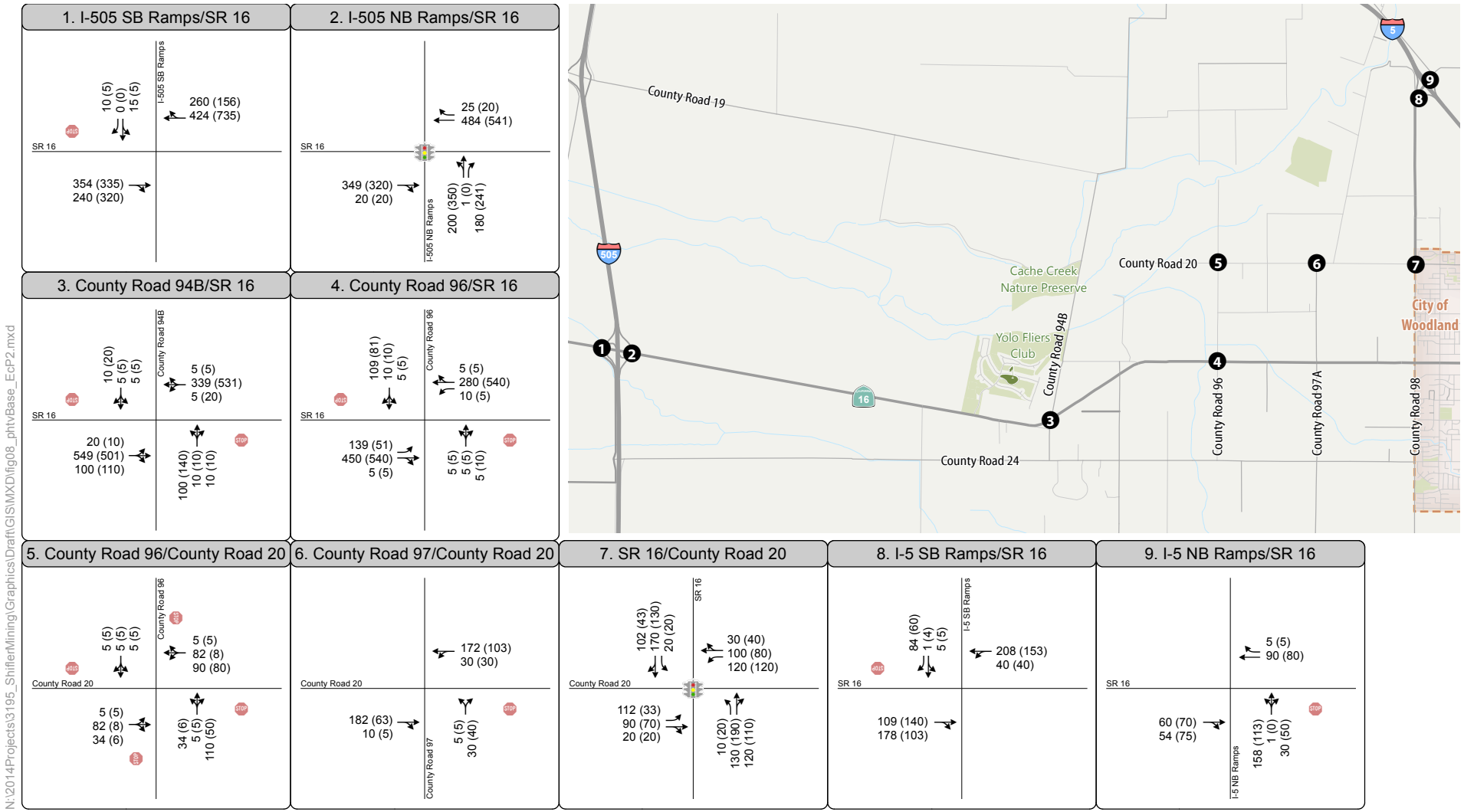
TABLE 27 INTERSECTION LEVEL OF SERVICE – CUMULATIVE PLUS SCENARIO 4

Intersection	Control	Cumulative Baseline				Cumulative Plus Scenario 4			
		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. SR 16/I-505 Southbound Ramps	Side Street Stop	1 (25)	A (D)	1 (34)	A (D)	1 (25)	A (D)	1 (34)	A (D)
2. SR 16/I-505 Northbound Ramps	Traffic Signal	8	A	9	A	8	A	9	A
3. SR 16/County Road 94B	Side Street Stop	8 **(69)**	A **(F)**	33 **(268)**	D **(F)**	8 **(74)**	A **(F)**	33 **(268)**	D **(F)**
4. SR 16/County Road 96	Side Street Stop	3 (34)	A (D)	2 (27)	A (D)	4 **(37)**	A **(E)**	2 (27)	A (D)
5. County Road 20/County Road 96	All Way Stop	9	A	8	A	10	A	8	A
6. County Road 20/County Road 97	Side Street Stop	2 (10)	A (A)	3 (9)	A (A)	1 (10)	A (B)	3 (9)	A (A)
7. County Road 20/SR 16 (County Road 98)	Traffic Signal	17	B	16	B	18	B	16	B
8. SR 16/Interstate 5 (I-5) Southbound Ramps	Side Street Stop	2 (13)	A (B)	2 (14)	A (B)	2 (13)	A (B)	2 (14)	A (B)
9. SR 16/I-5 Northbound Ramps	Side Street Stop	6 (11)	A (B)	5 (10)	A (B)	7 (12)	A (B)	5 (10)	A (B)

Notes: [1] For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for the overall intersection. For unsignalized (side street stop controlled) intersections, average intersection delay is reported in seconds per vehicle for the overall intersection (worst movement). All results are rounded to the nearest second.
Bold indicates unacceptable operations.
Shaded indicates a significant impact.
Source: Fehr & Peers, 2015

As shown in Table 27, the SR 16/County Road 94B intersection is expected to operate at LOS F during the AM and PM peak hours, and the project is expected to add 10 or more vehicles to the intersection

creating a significant impact. The SR 16/County Road 96 intersection is expected to degrade from LOS D (acceptable operations) to LOS E (unacceptable operations) during the AM peak hour under cumulative plus Scenario 4 conditions, creating a significant impact. The remaining study intersections are expected to operate at acceptable levels of service with a production level of 2.2 million tons at the Woodland Plant.



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Turn Lane

AM (PM) Peak Hour Traffic Volume

1 Study Intersection

Traffic Signal

Stop Sign

Figure 7

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Plus Project Conditions (Scenario 4)

RECOMMENDED IMPROVEMENTS

SR 16/County Road 94B

The SR 16/County Road 94B intersection is expected to operate at LOS F under cumulative baseline conditions. The project will add 10 or more vehicles to this intersection during the AM peak hour with Scenarios 3 and 4. Two options for improvement are available at this intersection. The addition of an acceleration lane or a two-way left-turn lane on the eastbound and westbound legs (SR 16) of the SR 16/County Road 94B intersection would improve operations at the intersection to LOS C during the AM peak hour and LOS D during the PM peak hour for all project scenarios. A traffic signal would also improve operations at the intersection to acceptable levels. The intersection meets the Peak Hour Signal Warrant criteria for the AM and PM peak hours under cumulative plus project conditions for Scenarios 3 and 4. The project applicant should pay a fair share contribution towards the improvement to this intersection.

SR 16/County Road 96

The SR 16/County Road 96 intersection will degrade from LOS D under cumulative baseline conditions to LOS E under cumulative plus project conditions during the AM peak hour with Scenarios 2, 3, and 4. Two options for improvement are available at this intersection. The addition of an acceleration lane or a two-way left-turn lane on the eastbound and westbound legs (SR 16) of the SR 16/County Road 96 intersection would improve operations at the intersection to LOS C. A traffic signal would improve operations at the intersection to LOS B. The intersection meets the Peak Hour Signal Warrant criteria for the AM and PM peak hours under cumulative plus project conditions for Scenarios 2, 3, and 4. The project applicant should pay a fair share contribution towards the improvement to this intersection.

CUMULATIVE PLUS PROJECT ROADWAY SEGMENT OPERATIONS

SCENARIOS 2 (1.5 MTY FROM WOODLAND AND 0.7 MTY FROM ESPARTO) AND 3 (1.8 MTY FROM WOODLAND AND 0.4 MTY FROM ESPARTO)

As shown in Table 28 below, the study roadway segments are expected to operate at acceptable levels of service with project traffic generated by the production of 2.2 million tons of aggregate per year at the Woodland Plant (Scenario 4). Scenarios 2 and 3 will generate less traffic on the study roadway segments than Scenario 4, and therefore will also result in acceptable levels of service.

SCENARIO 4 – 2.2 MTY FROM WOODLAND

Table 28 shows the cumulative plus project peak hour roadway segment LOS results for the study roadway segments. The technical calculations are provided in Appendix C.

TABLE 28 ROADWAY SEGMENT LEVEL OF SERVICE – CUMULATIVE PLUS SCENARIO 4

Roadway - Location	Roadway Classification[1]	AM Peak Hour			PM Peak Hour		
		ATS (mph)[2]	PTSF (%)[3]	LOS	ATS (mph)	PTSF (%)	LOS
SR 16 – I-505 to County Road 94B	Class I Highway	EB – 41.3 WB – 41.8	EB – 79.7 WB – 65.1	D D	EB – 40.2 WB – 40.9	EB – 75.7 WB – 77.0	D D
SR 16 – County Road 94B to County Road 96	Class I Highway	EB – 41.8 WB – 42.6	EB – 76.6 WB – 59.7	D D	EB – 40.5 WB – 41.1	EB – 74.9 WB – 75.3	D D
County Road 96 – County Road 20 to SR 16	Class II Highway	NA[2]	NB – 46.3 SB – 35.6	B A	NA[2]	NB – 18.9 SB – 38.1	A A
County Road 20 – West of County Road 96	Class II Highway	NA[2]	EB – 35.3 WB – 50.4	A B	NA[2]	EB – 19.3 WB – 15.1	A A
County Road 20 – County Road 96 to County Road 98	Class II Highway	NA[2]	EB – 51.8 WB – 54.8	B B	NA[2]	EB – 32.9 WB – 37.0	A A
SR 16 (County Road 98) – County Road 20 to I-5	Class II Highway	NB – 45.9 SB – 45.7	NB – 56.4 SB – 56.9	C C	NB – 46.9 SB – 47.0	NB – 54.3 SB – 47.4	C C

Notes: [1] Based on *Highway Capacity 2010*
[2] Average Travel Speed (ATS) is only reported for Class I Highways based on HCM 2010 methodology
[3] PTSF = Percent Time Spent Following
Bold indicates unacceptable operations.
Source: Fehr & Peers, 2015

As shown in Table 28, the study roadway segments are expected to operate at acceptable levels of service with Scenario 4.

CUMULATIVE PLUS PROJECT ROADWAY SEGMENT CAPACITY ANALYSIS

SCENARIOS 2 (1.5 MTY FROM WOODLAND AND 0.7 MTY FROM ESPARTO) AND 3 (1.8 MTY FROM WOODLAND AND 0.4 MTY FROM ESPARTO)

The Scenario 4 roadway segment capacity analysis results (provided in Table 29 below) show that the study roadway segments are expected to operate at acceptable levels of service with project traffic generated by the production of 2.2 million tons of aggregate per year at the Woodland Plant. Scenarios 2 and 3 will generate less traffic on the study roadway segments than Scenario 4, and therefore will also result in acceptable levels of service.

SCENARIO 4 – 2.2 MILLION TONS PER YEAR

Table 29 shows the cumulative plus project peak hour roadway segment capacity analysis results for Scenario 4.

TABLE 29 ROADWAY SEGMENT CAPACITY ANALYSIS – CUMULATIVE PLUS SCENARIO 4

Roadway - Location	Roadway Classification[1]	Number of Lanes	AM Peak Hour		PM Peak Hour	
			One-Way Volume	LOS	One-Way Volume	LOS
SR 16 – I-505 to County Road 94B	Conventional Two-Lane Highway	2	EB – 669 WB – 449	C C	EB – 621 WB – 691	C C
SR 16 – County Road 94B to County Road 96	Conventional Two-Lane Highway	2	EB – 594 WB – 394	C C	EB – 596 WB – 626	C C
County Road 96 – County Road 20 to SR 16	Local Roadway	2	NB - 149 SB – 129	NA NA	NB - 61 SB – 111	NA NA
County Road 20 – West of County Road 96	Local Roadway	2	EB – 121 WB – 131	NA NA	EB – 19 WB – 14	NA NA
County Road 20 – County Road 96 to County Road 98	Local Roadway	2	EB – 222 WB – 212	NA NA	EB – 123 WB – 143	NA NA
SR 16 (County Road 98) – County Road 20 to I-5	Conventional Two-Lane Highway	2	NB – 287 SB – 292	B C	NB – 243 SB – 213	B B

Notes: [1] Based on *Yolo County 2030 Countywide General Plan*
Bold indicates unacceptable operations.
Source: Fehr & Peers, 2015

As shown in Table 29, the study roadway segments are expected to operate at acceptable levels of service with Scenario 4 project traffic.

CUMULATIVE PLUS PROJECT FREEWAY OPERATIONS

SCENARIOS 2 (1.5 MTY FROM WOODLAND AND 0.7 MTY FROM ESPARTO) AND 3 (1.8 MTY FROM WOODLAND AND 0.4 MTY FROM ESPARTO)

The Scenario 4 freeway operations analysis results (provided in Table 32 below) show that the study freeway facilities are expected to operate at acceptable levels of service with project traffic generated by the production of 2.2 million tons of aggregate per year at the Woodland Plant. Under scenarios 2 and 3 the project will generate less traffic on I-5 than Scenario 4, and therefore will also result in acceptable levels of service on the freeway facilities. Scenarios 2 and 3 will generate more traffic on I-505 than Scenario 4 from the Esparto Plant. Tables 30 and 31 show the cumulative plus project conditions peak hour freeway segment LOS analysis results on I-505 for Scenarios 2 and 3, respectively.

TABLE 30 FREEWAY LEVEL OF SERVICE – CUMULATIVE PLUS SCENARIO 2

Freeway - 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
I-505 Northbound	South of SR 16	Basic	0.24	8.2	A	0.25	8.6	A
	SR 16 Off-Ramp	Diverge	0.26	12.6	B	0.27	13.0	B
	SR 16 Loop On-Ramp	Merge	0.16	9.8	A	0.12	8.5	A
	SR 16 On-Ramp	Merge	0.17	10.3	B	0.13	8.9	A
	North of SR 16	Basic	0.16	5.4	A	0.12	4.2	A
I-505 Southbound	North of SR 16	Basic	0.16	5.4	A	0.14	4.8	A
	SR 16 Off-Ramp	Diverge	0.17	9.5	A	0.15	8.7	A
	SR 16 Loop On-Ramp	Merge	0.23	11.6	B	0.18	10.1	B
	SR 16 On-Ramp	Merge	0.29	13.9	B	0.26	13.0	B
	South of SR 16	Basic	0.28	9.5	A	0.25	8.7	A

Notes: [1] v/c Ratio = volume-to-capacity ratio
[2] pcplpm = passenger cars per lane per mile
Source: Fehr & Peers, 2015

As shown in Table 30, the I-505 study freeway facilities are expected to operate at acceptable levels of service with Scenario 2.

TABLE 31 FREEWAY LEVEL OF SERVICE – CUMULATIVE PLUS SCENARIO 3

Freeway - 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
I-505 Northbound	South of SR 16	Basic	0.24	8.1	A	0.25	8.5	A
	SR 16 Off-Ramp	Diverge	0.26	12.5	B	0.27	13.0	B
	SR 16 Loop On-Ramp	Merge	0.16	9.7	A	0.12	8.5	A
	SR 16 On-Ramp	Merge	0.16	10.2	B	0.13	8.9	A
	North of SR 16	Basic	0.16	5.3	A	0.12	4.2	A
I-505 Southbound	North of SR 16	Basic	0.16	5.3	A	0.14	4.8	A
	SR 16 Off-Ramp	Diverge	0.17	9.4	A	0.15	8.7	A
	SR 16 Loop On-Ramp	Merge	0.22	11.5	B	0.18	10.1	B
	SR 16 On-Ramp	Merge	0.29	13.8	B	0.26	13.0	B
	South of SR 16	Basic	0.27	9.4	A	0.25	8.7	A

Notes: [1] v/c Ratio = volume-to-capacity ratio
[2] pcplpm = passenger cars per lane per mile
Source: Fehr & Peers, 2015

As shown in Table 31, the I-505 study freeway facilities are expected to operate at acceptable levels of service with Scenario 3.

SCENARIO 4 – 2.2 MTY FROM WOODLAND

Table 32 shows the cumulative plus project conditions peak hour freeway segment (including basic, merge, and diverge sections) LOS analysis results for Scenario 4. The technical calculations are provided in Appendix D.

TABLE 32 FREEWAY LEVEL OF SERVICE – CUMULATIVE PLUS SCENARIO 4

Freeway - 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
I-5 Northbound	South of SR 16	Basic	0.37	12.8	B	0.32	11.1	B
	SR 16 Off-Ramp	Diverge	0.41	18.4	B	0.35	16.4	B
	SR 16 Loop On-Ramp	Merge	0.35	16.8	B	0.32	15.5	B
	SR 16 On-Ramp	Merge	0.35	16.0	B	0.32	14.8	B
	North of SR 16	Basic	0.34	11.6	B	0.30	10.4	A
I-5 Southbound	North of SR 16	Basic	0.30	10.1	A	0.35	11.9	B
	SR 16 Off-Ramp	Diverge	0.32	14.7	B	0.38	16.8	B
	SR 16 On-Ramp	Merge	0.34	16.0	B	0.38	17.4	B
	South of SR 16	Basic	0.33	11.3	B	0.37	12.5	B
I-505 Northbound	South of SR 16	Basic	0.23	8.0	A	0.25	8.5	A
	SR 16 Off-Ramp	Diverge	0.26	12.4	B	0.27	13.0	B
	SR 16 Loop On-Ramp	Merge	0.15	9.6	A	0.12	8.5	A
	SR 16 On-Ramp	Merge	0.16	10.0	B	0.13	8.9	A
	North of SR 16	Basic	0.15	5.2	A	0.12	4.2	A
I-505 Southbound	North of SR 16	Basic	0.15	5.2	A	0.14	4.7	A
	SR 16 Off-Ramp	Diverge	0.17	9.2	A	0.15	8.7	A
	SR 16 Loop On-Ramp	Merge	0.22	11.4	B	0.18	10.1	B
	SR 16 On-Ramp	Merge	0.28	13.6	B	0.26	13.0	B
	South of SR 16	Basic	0.27	9.3	A	0.25	8.7	A

Notes: [1] v/c Ratio = volume-to-capacity ratio
[2] pcplpm = passenger cars per lane per mile
Source: Fehr & Peers, 2015

As shown in Table 32, the study freeway facilities are expected to operate at acceptable levels of service with Scenario 4.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions were found based on the traffic operations analysis performed:

- All of the study intersections, roadway segments, and freeway facilities currently operate at acceptable levels of service.
- The proposed project was analyzed under four existing plus project conditions scenarios:
    - Scenario 1: Production of 1.2 million tons per year at the Woodland Plant (existing permitted maximum)
    - Scenario 2: Production of 1.5 million tons per year at the Woodland Plant (existing permitted maximum plus 300,000 tons per year)
    - Scenario 3: Production of 1.8 million tons per year at the Woodland Plant (existing permitted maximum plus 600,000 tons per year)
    - Scenario 4: Production of 2.2 million tons per year at the Woodland Plant (existing permitted maximum plus 1 million tons per year)
- Scenario 1 will generate: 110 AM peak hour trips, 4 PM peak hour trips
- Scenario 2 will generate: 138 AM peak hour trips, 6 PM peak hour trips
- Scenario 3 will generate: 166 AM peak hour trips, 8 PM peak hour trips
- Scenario 4 will generate: 202 AM peak hour trips, 8 PM peak hour trips
- All of the study intersections, roadway segments, and freeway facilities are expected to operate at acceptable levels of service under existing plus project conditions with Scenarios 1, 2, 3, and 4.
- The cumulative baseline conditions analysis assumes that the Woodland and Esparto Plants will be operating at full capacity (1.2 MTY production at Woodland and 1 MTY production at Esparto) based on allowed production allotments.
- The SR 16/County Road 94B intersection is expected to operate at LOS F during the AM and PM peak hours under cumulative baseline conditions.
- The remaining study intersections, roadway segments, and freeway facilities are expected to operate at acceptable levels of service under cumulative baseline conditions.
- The SR 16/County Road 94B intersection is expected to operate at LOS F under cumulative baseline conditions and the project will add 10 or more vehicles to this intersection during the AM peak hour with Scenarios 3 and 4, creating a significant impact. The project applicant shall pay a fair share contribution toward improvement to this intersection.

  - The addition of an acceleration lane or a two-way left-turn lane on the eastbound and westbound legs of the SR 16/County Road 94B intersection would improve operations at the intersection to LOS C during the AM peak hour and LOS D during the PM peak hour for all project scenarios.
  - A traffic signal would also improve operations at the intersection to acceptable levels. The intersection meets the Peak Hour Signal Warrant criteria for the AM and PM peak hours under cumulative plus project conditions.

- The SR 16/County Road 96 intersection will degrade from LOS D under cumulative baseline conditions to LOS E under cumulative plus project conditions during the AM peak hour with Scenarios 2, 3, and 4. The project applicant shall pay a fair share contribution toward improvement to this intersection.
  - The addition of an acceleration lane or two-way left-turn lane on the eastbound and westbound legs of the SR 16/County Road 96 intersection would improve operations at the intersection to LOS C during the AM peak hour under cumulative plus project conditions.
  - A traffic signal would also improve operations at the intersection to acceptable levels. The intersection meets the Peak Hour Signal Warrant criteria for the AM and PM peak hours under cumulative plus project conditions.
- The remaining study intersections, roadway segments, and freeway facilities are expected to operate at acceptable levels of service under cumulative plus project conditions with Scenarios 2, 3, and 4.

APPENDIX A: TRAFFIC COUNT DATA



ALL TRAFFIC DATA

Yolo County
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 14-7042-009 I-505 SB Ramps-State Route 16.ppd
Date : 1/28/2014

Unshifted Count = All Vehicles

	I-505 SB Ramps Southbound					State Route 16 Westbound					I-505 SB Ramps Northbound					State Route 16 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	1	0	2	3	36	19	0	58	0	0	0	0	0	0	46	27	0	73	133	0
07:15	2	0	4	0	6	1	65	19	0	85	0	0	0	0	0	0	49	28	0	77	168	0
07:30	0	0	3	0	3	0	62	16	0	78	0	0	0	0	0	0	61	36	0	97	178	0
07:45	2	0	1	0	3	0	69	7	0	76	0	0	0	0	0	0	56	25	0	81	160	0
Total	5	0	9	0	14	4	232	61	0	297	0	0	0	0	0	0	212	116	0	328	639	0
08:00	1	0	1	0	2	1	43	13	0	57	0	0	0	0	0	0	42	23	0	65	124	0
08:15	1	0	1	0	2	1	50	9	0	60	0	0	0	0	0	0	48	13	0	61	123	0
08:30	0	0	1	0	1	1	67	6	0	74	0	0	0	0	0	0	34	15	0	49	124	0
08:45	0	0	2	0	2	0	64	7	0	71	0	0	0	0	0	0	40	17	0	57	130	0
Total	2	0	5	0	7	3	224	35	0	262	0	0	0	0	0	0	164	68	0	232	501	0
16:00	2	0	3	0	5	0	97	3	0	100	0	0	0	0	0	0	27	29	0	56	161	0
16:15	0	0	1	0	1	0	108	8	0	116	0	0	0	0	0	0	34	30	0	64	181	0
16:30	1	0	1	0	2	0	110	10	0	120	0	0	0	0	0	0	76	66	0	142	264	0
16:45	2	0	1	0	3	0	124	11	0	135	0	0	0	0	0	0	70	60	0	130	268	0
Total	5	0	6	0	11	0	439	32	0	471	0	0	0	0	0	0	207	185	0	392	874	0
17:00	1	0	2	0	3	0	107	10	0	117	0	0	0	0	0	0	82	41	0	123	243	0
17:15	1	0	1	0	2	1	123	19	0	143	0	0	0	0	0	0	64	43	0	107	252	0
17:30	0	0	1	0	1	1	102	19	0	122	0	0	0	0	0	0	72	35	0	107	230	0
17:45	1	0	0	0	1	0	113	10	0	123	0	0	0	0	0	0	43	36	0	79	203	0
Total	3	0	4	0	7	2	445	58	0	505	0	0	0	0	0	0	261	155	0	416	928	0
Grand Total	15	0	24	0	39	9	1340	186	0	1535	0	0	0	0	0	0	844	524	0	1368	2942	0
Apprch %	38.5%	0.0%	61.5%	0.0%		0.6%	87.3%	12.1%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	61.7%	38.3%	0.0%			
Total %	0.5%	0.0%	0.8%	0.0%	1.3%	0.3%	45.5%	6.3%	0.0%	52.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.7%	17.8%	0.0%	46.5%	100.0%	

AM PEAK HOUR	I-505 SB Ramps Southbound					State Route 16 Westbound					I-505 SB Ramps Northbound					State Route 16 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 07:00 to 08:00																					
Peak Hour For Entire Intersection Begins at 07:00																					
07:00	1	0	1	0	2	3	36	19	0	58	0	0	0	0	0	0	46	27	0	73	133
07:15	2	0	4	0	6	1	65	19	0	85	0	0	0	0	0	0	49	28	0	77	168
07:30	0	0	3	0	3	0	62	16	0	78	0	0	0	0	0	0	61	36	0	97	178
07:45	2	0	1	0	3	0	69	7	0	76	0	0	0	0	0	0	56	25	0	81	160
Total Volume	5	0	9	0	14	4	232	61	0	297	0	0	0	0	0	0	212	116	0	328	639
% App Total	35.7%	0.0%	64.3%	0.0%		1.3%	78.1%	20.5%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	64.6%	35.4%	0.0%		
PHF	.625	.000	.563	.000	.583	.333	.841	.803	.000	.874	.000	.000	.000	.000	.000	.000	.869	.806	.000	.845	.897

PM PEAK HOUR	I-505 SB Ramps Southbound					State Route 16 Westbound					I-505 SB Ramps Northbound					State Route 16 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	1	0	1	0	2	0	110	10	0	120	0	0	0	0	0	0	76	66	0	142	264
16:45	2	0	1	0	3	0	124	11	0	135	0	0	0	0	0	0	70	60	0	130	268
17:00	1	0	2	0	3	0	107	10	0	117	0	0	0	0	0	0	82	41	0	123	243
17:15	1	0	1	0	2	1	123	19	0	143	0	0	0	0	0	0	64	43	0	107	252
Total Volume	5	0	5	0	10	1	464	50	0	515	0	0	0	0	0	0	292	210	0	502	1027
% App Total	50.0%	0.0%	50.0%	0.0%		0.2%	90.1%	9.7%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	58.2%	41.8%	0.0%		
PHF	.625	.000	.625	.000	.833	.250	.935	.658	.000	.900	.000	.000	.000	.000	.000	.000	.890	.795	.000	.884	.958

ALL TRAFFIC DATA

Yolo County
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 14-7042-008 I-505 NB Ramps-State Route 16.ppd
Date : 1/28/2014

Unshifted Count = All Vehicles

	I-505 NB Ramps Southbound					State Route 16 Westbound					I-505 NB Ramps Northbound					State Route 16 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	0	0	0	0	0	45	0	0	45	13	0	7	0	20	0	45	2	0	47	112	0
07:15	0	0	0	0	0	0	74	3	0	77	9	0	4	0	13	0	49	1	0	50	140	0
07:30	0	0	0	0	0	0	58	3	0	61	20	1	11	0	32	0	59	3	0	62	155	0
07:45	0	0	0	0	0	0	51	4	0	55	26	0	8	0	34	0	54	4	0	58	147	0
Total	0	0	0	0	0	0	228	10	0	238	68	1	30	0	99	0	207	10	0	217	554	0
08:00	0	0	0	0	0	0	37	1	0	38	20	0	15	0	35	0	39	3	0	42	115	0
08:15	0	0	0	0	0	0	42	1	0	43	17	0	12	0	29	0	49	1	0	50	122	0
08:30	0	0	0	0	0	0	49	0	0	49	27	0	8	0	35	0	32	2	0	34	118	0
08:45	0	0	0	0	0	0	39	0	0	39	32	1	6	0	39	0	34	5	0	39	117	0
Total	0	0	0	0	0	0	167	2	0	169	96	1	41	0	138	0	154	11	0	165	472	0
16:00	0	0	0	0	0	0	58	1	0	59	40	0	13	0	53	0	29	1	0	30	142	0
16:15	0	0	0	0	0	0	72	1	0	73	46	0	13	0	59	0	32	2	0	34	166	0
16:30	0	0	0	0	0	0	71	2	0	73	51	0	24	0	75	0	71	4	0	75	223	0
16:45	0	0	0	0	0	0	75	3	0	78	57	0	14	0	71	1	67	5	0	73	222	0
Total	0	0	0	0	0	0	276	7	0	283	194	0	64	0	258	1	199	12	0	212	753	0
17:00	0	0	0	0	0	0	71	6	0	77	47	0	14	0	61	0	74	7	0	81	219	0
17:15	0	0	0	0	0	0	81	0	0	81	61	0	17	0	78	0	66	1	0	67	226	0
17:30	0	0	0	0	0	0	82	0	0	82	42	1	7	0	50	0	69	1	0	70	202	0
17:45	0	0	0	0	0	0	74	3	0	77	46	0	19	0	65	0	45	2	0	47	189	0
Total	0	0	0	0	0	0	308	9	0	317	196	1	57	0	254	0	254	11	0	265	836	0
Grand Total	0	0	0	0	0	0	979	28	0	1007	554	3	192	0	749	1	814	44	0	859	2615	0
Apprch %	0.0%	0.0%	0.0%	0.0%		0.0%	97.2%	2.8%	0.0%		74.0%	0.4%	25.6%	0.0%		0.1%	94.8%	5.1%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	37.4%	1.1%	0.0%	38.5%	21.2%	0.1%	7.3%	0.0%	28.6%	0.0%	31.1%	1.7%	0.0%	32.8%	100.0%	

AM PEAK HOUR	I-505 NB Ramps Southbound					State Route 16 Westbound					I-505 NB Ramps Northbound					State Route 16 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 07:00 to 08:00																					
Peak Hour For Entire Intersection Begins at 07:00																					
07:00	0	0	0	0	0	0	45	0	0	45	13	0	7	0	20	0	45	2	0	47	112
07:15	0	0	0	0	0	0	74	3	0	77	9	0	4	0	13	0	49	1	0	50	140
07:30	0	0	0	0	0	0	58	3	0	61	20	1	11	0	32	0	59	3	0	62	155
07:45	0	0	0	0	0	0	51	4	0	55	26	0	8	0	34	0	54	4	0	58	147
Total Volume	0	0	0	0	0	0	228	10	0	238	68	1	30	0	99	0	207	10	0	217	554
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	95.8%	4.2%	0.0%		68.7%	1.0%	30.3%	0.0%		0.0%	95.4%	4.6%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.770	.625	.000	.773	.654	.250	.682	.000	.728	.000	.877	.625	.000	.875	.894

PM PEAK HOUR	I-505 NB Ramps Southbound					State Route 16 Westbound					I-505 NB Ramps Northbound					State Route 16 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	0	0	0	0	0	71	2	0	73	51	0	24	0	75	0	71	4	0	75	223
16:45	0	0	0	0	0	0	75	3	0	78	57	0	14	0	71	1	67	5	0	73	222
17:00	0	0	0	0	0	0	71	6	0	77	47	0	14	0	61	0	74	7	0	81	219
17:15	0	0	0	0	0	0	81	0	0	81	61	0	17	0	78	0	66	1	0	67	226
Total Volume	0	0	0	0	0	0	298	11	0	309	216	0	69	0	285	1	278	17	0	296	890
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	96.4%	3.6%	0.0%		75.8%	0.0%	24.2%	0.0%		0.3%	93.9%	5.7%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.920	.458	.000	.954	.885	.000	.719	.000	.913	.250	.939	.607	.000	.914	.985

ALL TRAFFIC DATA

Yolo County
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 14-7042-007 County Road 94B-State Route 16.ppd
Date : 1/28/2014

Unshifted Count = All Vehicles

	County Road 94B Southbound					State Route 16 Westbound					County Road 94B Northbound					State Route 16 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	0	6	0	6	0	36	0	0	36	2	0	7	0	9	1	72	2	0	75	126	0
07:15	2	1	1	0	4	0	70	0	0	70	0	1	1	0	2	1	81	4	0	86	162	0
07:30	1	1	1	0	3	2	58	2	0	62	1	1	4	0	6	3	124	4	0	131	202	0
07:45	0	0	0	0	0	0	34	0	0	34	2	4	1	0	7	2	96	0	0	98	139	0
Total	3	2	8	0	13	2	198	2	0	202	5	6	13	0	24	7	373	10	0	390	629	0
08:00	1	0	2	0	3	1	46	0	0	47	1	0	0	0	1	5	85	3	0	93	144	0
08:15	1	0	0	0	1	1	58	1	0	60	4	0	1	0	5	5	74	3	0	82	148	0
08:30	0	3	0	0	3	1	55	2	0	58	1	2	2	0	5	1	61	1	0	63	129	0
08:45	0	2	1	0	3	1	50	0	0	51	1	1	2	0	4	1	59	2	0	62	120	0
Total	2	5	3	0	10	4	209	3	0	216	7	3	5	0	15	12	279	9	0	300	541	0
16:00	1	0	0	0	1	3	90	1	0	94	1	2	2	0	5	0	47	2	0	49	149	0
16:15	1	0	1	0	2	1	94	0	0	95	4	1	2	0	7	1	49	2	0	52	156	0
16:30	1	0	2	0	3	2	80	0	0	82	2	1	4	0	7	1	86	1	0	88	180	0
16:45	1	1	2	0	4	3	112	0	0	115	4	1	2	0	7	2	119	4	0	125	251	0
Total	4	1	5	0	10	9	376	1	0	386	11	5	10	0	26	4	301	9	0	314	736	0
17:00	2	0	5	0	7	4	118	0	0	122	4	2	2	0	8	1	88	3	0	92	229	0
17:15	1	2	2	0	5	1	106	0	0	107	1	0	2	0	3	0	92	2	0	94	209	0
17:30	0	1	6	0	7	4	113	0	0	117	8	3	3	0	14	0	87	2	0	89	227	0
17:45	0	2	0	0	2	2	97	0	0	99	1	1	1	0	3	0	71	0	0	71	175	0
Total	3	5	13	0	21	11	434	0	0	445	14	6	8	0	28	1	338	7	0	346	840	0
Grand Total	12	13	29	0	54	26	1217	6	0	1249	37	20	36	0	93	24	1291	35	0	1350	2746	0
Apprch %	22.2%	24.1%	53.7%	0.0%		2.1%	97.4%	0.5%	0.0%		39.8%	21.5%	38.7%	0.0%		1.8%	95.6%	2.6%	0.0%			
Total %	0.4%	0.5%	1.1%	0.0%	2.0%	0.9%	44.3%	0.2%	0.0%	45.5%	1.3%	0.7%	1.3%	0.0%	3.4%	0.9%	47.0%	1.3%	0.0%	49.2%	100.0%	

AM PEAK HOUR	County Road 94B Southbound					State Route 16 Westbound					County Road 94B Northbound					State Route 16 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	2	1	1	0	4	0	70	0	0	70	0	1	1	0	2	1	81	4	0	86	162
07:30	1	1	1	0	3	2	58	2	0	62	1	1	4	0	6	3	124	4	0	131	202
07:45	0	0	0	0	0	0	34	0	0	34	2	4	1	0	7	2	96	0	0	98	139
08:00	1	0	2	0	3	1	46	0	0	47	1	0	0	0	1	5	85	3	0	93	144
Total Volume	4	2	4	0	10	3	208	2	0	213	4	6	6	0	16	11	386	11	0	408	647
% App Total	40.0%	20.0%	40.0%	0.0%		1.4%	97.7%	0.9%	0.0%		25.0%	37.5%	37.5%	0.0%		2.7%	94.6%	2.7%	0.0%		
PHF	.500	.500	.500	.000	.625	.375	.743	.250	.000	.761	.500	.375	.375	.000	.571	.550	.778	.688	.000	.779	.801

PM PEAK HOUR	County Road 94B Southbound					State Route 16 Westbound					County Road 94B Northbound					State Route 16 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	1	2	0	4	3	112	0	0	115	4	1	2	0	7	2	119	4	0	125	251
17:00	2	0	5	0	7	4	118	0	0	122	4	2	2	0	8	1	88	3	0	92	229
17:15	1	2	2	0	5	1	106	0	0	107	1	0	2	0	3	0	92	2	0	94	209
17:30	0	1	6	0	7	4	113	0	0	117	8	3	3	0	14	0	87	2	0	89	227
Total Volume	4	4	15	0	23	12	449	0	0	461	17	6	9	0	32	3	386	11	0	400	916
% App Total	17.4%	17.4%	65.2%	0.0%		2.6%	97.4%	0.0%	0.0%		53.1%	18.8%	28.1%	0.0%		0.8%	96.5%	2.8%	0.0%		
PHF	.500	.500	.625	.000	.821	.750	.951	.000	.000	.945	.531	.500	.750	.000	.571	.375	.811	.688	.000	.800	.912

ALL TRAFFIC DATA

Yolo County
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 14-7042-002 County Road 96-State Route 16.ppd
Date : 1/28/2014

Unshifted Count = All Vehicles

	County Road 96 Southbound					State Route 16 Westbound					County Road 96 Northbound					State Route 16 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	5	11	0	16	0	44	1	0	45	1	0	1	0	2	9	72	0	0	81	144	0
07:15	0	2	14	0	16	4	57	0	0	61	0	0	3	0	3	14	84	1	0	99	179	0
07:30	0	3	11	0	14	1	58	0	0	59	0	2	0	0	2	17	107	2	0	126	201	0
07:45	1	0	12	0	13	1	38	0	0	39	2	2	2	0	6	14	93	1	0	108	166	0
Total	1	10	48	0	59	6	197	1	0	204	3	4	6	0	13	54	356	4	0	414	690	0
08:00	2	1	14	0	17	2	56	1	0	59	0	0	0	0	0	11	92	1	0	104	180	0
08:15	1	2	20	0	23	0	54	1	0	55	1	0	1	0	2	4	85	0	0	89	169	0
08:30	1	1	7	0	9	3	59	2	0	64	1	2	2	0	5	7	64	0	0	71	149	0
08:45	0	3	13	0	16	1	52	1	0	54	0	1	0	0	1	9	64	0	0	73	144	0
Total	4	7	54	0	65	6	221	5	0	232	2	3	3	0	8	31	305	1	0	337	642	0
16:00	0	1	14	0	15	1	106	0	0	107	0	2	3	0	5	10	84	0	0	94	221	0
16:15	0	1	20	0	21	0	97	1	0	98	0	4	5	0	9	6	64	0	0	70	198	0
16:30	0	1	16	0	17	1	82	1	0	84	0	0	1	0	1	8	103	0	0	111	213	0
16:45	0	3	21	0	24	0	120	2	0	122	0	3	0	0	3	13	130	1	0	144	293	0
Total	0	6	71	0	77	2	405	4	0	411	0	9	9	0	18	37	381	1	0	419	925	0
17:00	0	1	19	0	20	0	121	1	0	122	0	1	4	0	5	10	91	0	0	101	248	0
17:15	1	0	17	0	18	2	102	2	0	106	1	1	2	0	4	8	108	0	0	116	244	0
17:30	0	2	18	0	20	0	115	0	0	115	0	0	1	0	1	10	105	1	0	116	252	0
17:45	0	1	10	0	11	0	93	2	0	95	0	2	0	0	2	4	93	0	0	97	205	0
Total	1	4	64	0	69	2	431	5	0	438	1	4	7	0	12	32	397	1	0	430	949	0
Grand Total	6	27	237	0	270	16	1254	15	0	1285	6	20	25	0	51	154	1439	7	0	1600	3206	0
Apprch %	2.2%	10.0%	87.8%	0.0%		1.2%	97.6%	1.2%	0.0%		11.8%	39.2%	49.0%	0.0%		9.6%	89.9%	0.4%	0.0%			
Total %	0.2%	0.8%	7.4%	0.0%	8.4%	0.5%	39.1%	0.5%	0.0%	40.1%	0.2%	0.6%	0.8%	0.0%	1.6%	4.8%	44.9%	0.2%	0.0%	49.9%	100.0%	

AM PEAK HOUR	County Road 96 Southbound					State Route 16 Westbound					County Road 96 Northbound					State Route 16 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	0	2	14	0	16	4	57	0	0	61	0	0	3	0	3	14	84	1	0	99	179
07:30	0	3	11	0	14	1	58	0	0	59	0	2	0	0	2	17	107	2	0	126	201
07:45	1	0	12	0	13	1	38	0	0	39	2	2	2	0	6	14	93	1	0	108	166
08:00	2	1	14	0	17	2	56	1	0	59	0	0	0	0	0	11	92	1	0	104	180
Total Volume	3	6	51	0	60	8	209	1	0	218	2	4	5	0	11	56	376	5	0	437	726
% App Total	5.0%	10.0%	85.0%	0.0%		3.7%	95.9%	0.5%	0.0%		18.2%	36.4%	45.5%	0.0%		12.8%	86.0%	1.1%	0.0%		
PHF	.375	.500	.911	.000	.882	.500	.901	.250	.000	.893	.250	.500	.417	.000	.458	.824	.879	.625	.000	.867	.903

PM PEAK HOUR	County Road 96 Southbound					State Route 16 Westbound					County Road 96 Northbound					State Route 16 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	3	21	0	24	0	120	2	0	122	0	3	0	0	3	13	130	1	0	144	293
17:00	0	1	19	0	20	0	121	1	0	122	0	1	4	0	5	10	91	0	0	101	248
17:15	1	0	17	0	18	2	102	2	0	106	1	1	2	0	4	8	108	0	0	116	244
17:30	0	2	18	0	20	0	115	0	0	115	0	0	1	0	1	10	105	1	0	116	252
Total Volume	1	6	75	0	82	2	458	5	0	465	1	5	7	0	13	41	434	2	0	477	1037
% App Total	1.2%	7.3%	91.5%	0.0%		0.4%	98.5%	1.1%	0.0%		7.7%	38.5%	53.8%	0.0%		8.6%	91.0%	0.4%	0.0%		
PHF	.250	.500	.893	.000	.854	.250	.946	.625	.000	.953	.250	.417	.438	.000	.650	.788	.835	.500	.000	.828	.885

ALL TRAFFIC DATA

Yolo County
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 14-7042-001 County Road 96-County Road 20.ppd
Date : 1/28/2014

Unshifted Count = All Vehicles

	County Road 96 Southbound					County Road 20 Westbound					County Road 96 Northbound					County Road 20 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	0	0	1	16	3	0	0	19	0	0	8	0	8	0	0	0	0	0	28	0
07:15	0	0	0	0	0	17	2	0	0	19	0	0	15	0	15	0	2	0	0	2	36	0
07:30	1	0	0	0	1	13	2	0	0	15	0	1	16	0	17	0	3	0	0	3	36	0
07:45	0	0	0	0	0	14	2	0	0	16	0	0	17	0	17	0	1	1	0	2	35	0
Total	2	0	0	0	2	60	9	0	0	69	0	1	56	0	57	0	6	1	0	7	135	0
08:00	0	0	0	0	0	15	1	0	0	16	1	0	12	0	13	0	4	0	0	4	33	0
08:15	0	0	0	0	0	19	2	0	0	21	0	0	5	0	5	0	1	1	0	2	28	0
08:30	0	0	0	0	0	8	2	0	0	10	0	1	6	0	7	0	2	0	0	2	19	0
08:45	1	1	0	0	2	16	4	0	0	20	1	0	8	0	9	1	1	0	0	2	33	0
Total	1	1	0	0	2	58	9	0	0	67	2	1	31	0	34	1	8	1	0	10	113	0
16:00	0	0	0	0	0	13	1	0	0	14	0	0	11	0	11	0	0	1	0	1	26	0
16:15	0	0	0	0	0	18	0	0	0	18	0	0	11	0	11	0	0	0	0	0	29	0
16:30	0	0	0	0	0	18	0	0	0	18	0	0	8	0	8	0	0	0	0	0	26	0
16:45	0	0	0	0	0	21	2	0	0	23	0	0	17	0	17	0	1	0	0	1	41	0
Total	0	0	0	0	0	70	3	0	0	73	0	0	47	0	47	0	1	1	0	2	122	0
17:00	2	0	0	0	2	17	1	1	0	19	0	0	10	0	10	0	0	0	0	0	31	0
17:15	0	0	0	0	0	17	1	1	0	19	0	0	10	0	10	0	1	1	0	2	31	0
17:30	0	0	0	0	0	17	0	0	0	17	0	0	9	0	9	0	1	0	0	1	27	0
17:45	0	0	0	0	0	12	0	0	0	12	0	0	6	0	6	0	1	0	0	1	19	0
Total	2	0	0	0	2	63	2	2	0	67	0	0	35	0	35	0	3	1	0	4	108	0
Grand Total	5	1	0	0	6	251	23	2	0	276	2	2	169	0	173	1	18	4	0	23	478	0
Apprch %	83.3%	16.7%	0.0%	0.0%		90.9%	8.3%	0.7%	0.0%		1.2%	1.2%	97.7%	0.0%		4.3%	78.3%	17.4%	0.0%			
Total %	1.0%	0.2%	0.0%	0.0%	1.3%	52.5%	4.8%	0.4%	0.0%	57.7%	0.4%	0.4%	35.4%	0.0%	36.2%	0.2%	3.8%	0.8%	0.0%	4.8%	100.0%	

AM PEAK HOUR	County Road 96 Southbound					County Road 20 Westbound					County Road 96 Northbound					County Road 20 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	0	0	0	0	0	17	2	0	0	19	0	0	15	0	15	0	2	0	0	2	36
07:30	1	0	0	0	1	13	2	0	0	15	0	1	16	0	17	0	3	0	0	3	36
07:45	0	0	0	0	0	14	2	0	0	16	0	0	17	0	17	0	1	1	0	2	35
08:00	0	0	0	0	0	15	1	0	0	16	1	0	12	0	13	0	4	0	0	4	33
Total Volume	1	0	0	0	1	59	7	0	0	66	1	1	60	0	62	0	10	1	0	11	140
% App Total	100.0%	0.0%	0.0%	0.0%		89.4%	10.6%	0.0%	0.0%		1.6%	1.6%	96.8%	0.0%		0.0%	90.9%	9.1%	0.0%		
PHF	.250	.000	.000	.000	.250	.868	.875	.000	.000	.868	.250	.250	.882	.000	.912	.000	.625	.250	.000	.688	.972

PM PEAK HOUR	County Road 96 Southbound					County Road 20 Westbound					County Road 96 Northbound					County Road 20 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	0	0	0	0	21	2	0	0	23	0	0	17	0	17	0	1	0	0	1	41
17:00	2	0	0	0	2	17	1	1	0	19	0	0	10	0	10	0	0	0	0	0	31
17:15	0	0	0	0	0	17	1	1	0	19	0	0	10	0	10	0	1	1	0	2	31
17:30	0	0	0	0	0	17	0	0	0	17	0	0	9	0	9	0	1	0	0	1	27
Total Volume	2	0	0	0	2	72	4	2	0	78	0	0	46	0	46	0	3	1	0	4	130
% App Total	100.0%	0.0%	0.0%	0.0%		92.3%	5.1%	2.6%	0.0%		0.0%	0.0%	100.0%	0.0%		0.0%	75.0%	25.0%	0.0%		
PHF	.250	.000	.000	.000	.250	.857	.500	.500	.000	.848	.000	.000	.676	.000	.676	.000	.750	.250	.000	.500	.793

ALL TRAFFIC DATA

Yolo County
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 14-7042-003 County Road 97-County Road 20.ppd
Date : 1/28/2014

Unshifted Count = All Vehicles

	County Road 97 Southbound					County Road 20 Westbound					County Road 97 Northbound					County Road 20 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	0	0	0	0	8	20	0	0	28	0	0	3	0	3	0	12	0	0	12	43	0
07:15	0	0	0	0	0	1	17	0	0	18	1	0	2	0	3	0	18	0	0	18	39	0
07:30	0	0	0	0	0	7	13	0	0	20	1	0	4	0	5	0	20	4	0	24	49	0
07:45	0	0	0	0	0	3	14	0	0	17	0	0	6	0	6	0	21	0	0	21	44	0
Total	0	0	0	0	0	19	64	0	0	83	2	0	15	0	17	0	71	4	0	75	175	0
08:00	0	0	0	0	0	7	21	0	0	28	0	0	6	0	6	0	14	3	0	17	51	0
08:15	0	0	0	0	0	6	19	0	0	25	0	0	11	0	11	0	5	0	0	5	41	0
08:30	0	0	0	0	0	0	9	0	0	9	1	0	7	0	8	0	8	0	0	8	25	0
08:45	0	0	0	0	0	3	22	0	0	25	1	0	5	0	6	0	11	0	0	11	42	0
Total	0	0	0	0	0	16	71	0	0	87	2	0	29	0	31	0	38	3	0	41	159	0
16:00	0	0	0	0	0	3	16	0	0	19	0	0	9	0	9	0	10	0	0	10	38	0
16:15	0	0	0	0	0	4	18	0	0	22	1	0	4	0	5	0	13	0	0	13	40	0
16:30	0	0	0	0	0	6	22	0	0	28	1	0	4	0	5	0	10	1	0	11	44	0
16:45	0	0	0	0	0	7	23	0	0	30	1	0	10	0	11	0	18	0	0	18	59	0
Total	0	0	0	0	0	20	79	0	0	99	3	0	27	0	30	0	51	1	0	52	181	0
17:00	0	0	0	0	0	9	24	0	0	33	1	0	12	0	13	0	11	0	0	11	57	0
17:15	0	0	0	0	0	2	19	0	0	21	1	0	3	0	4	0	13	0	0	13	38	0
17:30	0	0	0	0	0	8	21	0	0	29	1	0	6	0	7	0	12	0	0	12	48	0
17:45	0	0	0	0	0	9	14	0	0	23	0	0	2	0	2	0	6	1	0	7	32	0
Total	0	0	0	0	0	28	78	0	0	106	3	0	23	0	26	0	42	1	0	43	175	0
Grand Total	0	0	0	0	0	83	292	0	0	375	10	0	94	0	104	0	202	9	0	211	690	0
Apprch %	0.0%	0.0%	0.0%	0.0%		22.1%	77.9%	0.0%	0.0%		9.6%	0.0%	90.4%	0.0%		0.0%	95.7%	4.3%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	12.0%	42.3%	0.0%	0.0%	54.3%	1.4%	0.0%	13.6%	0.0%	15.1%	0.0%	29.3%	1.3%	0.0%	30.6%	100.0%	

AM PEAK HOUR	County Road 97 Southbound					County Road 20 Westbound					County Road 97 Northbound					County Road 20 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	0	0	0	0	7	13	0	0	20	1	0	4	0	5	0	20	4	0	24	49
07:45	0	0	0	0	0	3	14	0	0	17	0	0	6	0	6	0	21	0	0	21	44
08:00	0	0	0	0	0	7	21	0	0	28	0	0	6	0	6	0	14	3	0	17	51
08:15	0	0	0	0	0	6	19	0	0	25	0	0	11	0	11	0	5	0	0	5	41
Total Volume	0	0	0	0	0	23	67	0	0	90	1	0	27	0	28	0	60	7	0	67	185
% App Total	0.0%	0.0%	0.0%	0.0%		25.6%	74.4%	0.0%	0.0%		3.6%	0.0%	96.4%	0.0%		0.0%	89.6%	10.4%	0.0%		
PHF	.000	.000	.000	.000	.000	.821	.798	.000	.000	.804	.250	.000	.614	.000	.636	.000	.714	.438	.000	.698	.907

PM PEAK HOUR	County Road 97 Southbound					County Road 20 Westbound					County Road 97 Northbound					County Road 20 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	0	0	0	0	7	23	0	0	30	1	0	10	0	11	0	18	0	0	18	59
17:00	0	0	0	0	0	9	24	0	0	33	1	0	12	0	13	0	11	0	0	11	57
17:15	0	0	0	0	0	2	19	0	0	21	1	0	3	0	4	0	13	0	0	13	38
17:30	0	0	0	0	0	8	21	0	0	29	1	0	6	0	7	0	12	0	0	12	48
Total Volume	0	0	0	0	0	26	87	0	0	113	4	0	31	0	35	0	54	0	0	54	202
% App Total	0.0%	0.0%	0.0%	0.0%		23.0%	77.0%	0.0%	0.0%		11.4%	0.0%	88.6%	0.0%		0.0%	100.0%	0.0%	0.0%		
PHF	.000	.000	.000	.000	.000	.722	.906	.000	.000	.856	1.000	.000	.646	.000	.673	.000	.750	.000	.000	.750	.856

ALL TRAFFIC DATA

Yolo County
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 14-7042-004 State Route 16 (CR 98)-County Road 20.ppd
Date : 1/28/2014

Unshifted Count = All Vehicles

	State Route 16 (CR 98) Southbound					County Road 20 Westbound					State Route 16 (CR 98) Northbound					County Road 20 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	22	5	0	28	13	17	5	0	35	2	20	17	0	39	7	8	1	0	16	118	0
07:15	1	24	7	0	32	16	8	2	0	26	1	28	17	0	46	8	12	1	0	21	125	0
07:30	2	29	9	0	40	19	14	1	0	34	0	29	22	0	51	7	13	3	0	23	148	0
07:45	8	57	4	0	69	22	8	2	0	32	2	30	40	0	72	5	20	5	0	30	203	0
Total	12	132	25	0	169	70	47	10	0	127	5	107	96	0	208	27	53	10	0	90	594	0
08:00	1	48	9	0	58	23	22	7	0	52	3	27	25	0	55	5	15	4	0	24	189	0
08:15	4	27	5	0	36	25	15	2	0	42	2	36	20	0	58	5	15	1	0	21	157	0
08:30	3	27	4	0	34	17	9	9	0	35	0	32	17	0	49	4	11	1	0	16	134	0
08:45	4	27	10	0	41	17	10	5	0	32	3	22	18	0	43	5	11	2	0	18	134	0
Total	12	129	28	0	169	82	56	23	0	161	8	117	80	0	205	19	52	8	0	79	614	0
16:00	5	42	1	0	48	28	15	11	0	54	2	37	18	0	57	4	10	0	0	14	173	0
16:15	4	36	6	0	46	29	16	6	0	51	1	27	23	0	51	7	10	2	0	19	167	0
16:30	1	30	12	0	43	20	14	4	0	38	4	54	28	0	86	3	11	5	0	19	186	0
16:45	4	32	10	0	46	28	17	2	0	47	4	45	23	0	72	9	20	3	0	32	197	0
Total	14	140	29	0	183	105	62	23	0	190	11	163	92	0	266	23	51	10	0	84	723	0
17:00	3	22	9	0	34	26	19	4	0	49	5	54	22	0	81	8	14	4	0	26	190	0
17:15	2	35	10	0	47	14	12	4	0	30	3	36	18	0	57	5	9	4	0	18	152	0
17:30	4	40	7	0	51	19	17	3	0	39	7	41	27	0	75	4	13	1	0	18	183	0
17:45	4	27	4	0	35	11	14	2	0	27	3	34	18	0	55	1	8	1	0	10	127	0
Total	13	124	30	0	167	70	62	13	0	145	18	165	85	0	268	18	44	10	0	72	652	0
Grand Total	51	525	112	0	688	327	227	69	0	623	42	552	353	0	947	87	200	38	0	325	2583	0
Apprch %	7.4%	76.3%	16.3%	0.0%		52.5%	36.4%	11.1%	0.0%		4.4%	58.3%	37.3%	0.0%		26.8%	61.5%	11.7%	0.0%			
Total %	2.0%	20.3%	4.3%	0.0%	26.6%	12.7%	8.8%	2.7%	0.0%	24.1%	1.6%	21.4%	13.7%	0.0%	36.7%	3.4%	7.7%	1.5%	0.0%	12.6%	100.0%	

AM PEAK HOUR	State Route 16 (CR 98) Southbound					County Road 20 Westbound					State Route 16 (CR 98) Northbound					County Road 20 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	2	29	9	0	40	19	14	1	0	34	0	29	22	0	51	7	13	3	0	23	148
07:45	8	57	4	0	69	22	8	2	0	32	2	30	40	0	72	5	20	5	0	30	203
08:00	1	48	9	0	58	23	22	7	0	52	3	27	25	0	55	5	15	4	0	24	189
08:15	4	27	5	0	36	25	15	2	0	42	2	36	20	0	58	5	15	1	0	21	157
Total Volume	15	161	27	0	203	89	59	12	0	160	7	122	107	0	236	22	63	13	0	98	697
% App Total	7.4%	79.3%	13.3%	0.0%		55.6%	36.9%	7.5%	0.0%		3.0%	51.7%	45.3%	0.0%		22.4%	64.3%	13.3%	0.0%		
PHF	.469	.706	.750	.000	.736	.890	.670	.429	.000	.769	.583	.847	.669	.000	.819	.786	.788	.650	.000	.817	.858

PM PEAK HOUR	State Route 16 (CR 98) Southbound					County Road 20 Westbound					State Route 16 (CR 98) Northbound					County Road 20 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 16:15 to 17:15																					
Peak Hour For Entire Intersection Begins at 16:15																					
16:15	4	36	6	0	46	29	16	6	0	51	1	27	23	0	51	7	10	2	0	19	167
16:30	1	30	12	0	43	20	14	4	0	38	4	54	28	0	86	3	11	5	0	19	186
16:45	4	32	10	0	46	28	17	2	0	47	4	45	23	0	72	9	20	3	0	32	197
17:00	3	22	9	0	34	26	19	4	0	49	5	54	22	0	81	8	14	4	0	26	190
Total Volume	12	120	37	0	169	103	66	16	0	185	14	180	96	0	290	27	55	14	0	96	740
% App Total	7.1%	71.0%	21.9%	0.0%		55.7%	35.7%	8.6%	0.0%		4.8%	62.1%	33.1%	0.0%		28.1%	57.3%	14.6%	0.0%		
PHF	.750	.833	.771	.000	.918	.888	.868	.667	.000	.907	.700	.833	.857	.000	.843	.750	.688	.700	.000	.750	.939

ALL TRAFFIC DATA

Yolo County
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 14-7042-005 I-5 SB Ramps-State Route 16.ppd
Date : 1/28/2014

Unshifted Count = All Vehicles

	I-5 SB Ramps Southbound					State Route 16 Westbound					I-5 SB Ramps Northbound					State Route 16 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	0	9	0	9	4	20	0	0	24	0	0	0	0	0	0	11	20	0	31	64	0
07:15	1	0	15	0	16	9	24	0	0	33	0	0	0	0	0	0	12	29	0	41	90	0
07:30	0	0	15	0	15	15	28	0	0	43	0	0	0	0	0	0	17	22	0	39	97	0
07:45	0	1	28	0	29	12	33	0	0	45	0	0	0	0	0	0	17	27	0	44	118	0
Total	1	1	67	0	69	40	105	0	0	145	0	0	0	0	0	0	57	98	0	155	369	0
08:00	0	0	19	0	19	3	40	0	0	43	0	0	0	0	0	0	20	20	0	40	102	0
08:15	0	0	9	0	9	4	28	0	0	32	0	0	0	0	0	0	25	19	0	44	85	0
08:30	0	0	14	0	14	7	17	0	0	24	0	0	0	0	0	0	23	25	0	48	86	0
08:45	0	0	7	0	7	9	37	0	0	46	0	0	0	0	0	0	18	15	0	33	86	0
Total	0	0	49	0	49	23	122	0	0	145	0	0	0	0	0	0	86	79	0	165	359	0
16:00	0	1	13	0	14	6	34	0	0	40	0	0	0	0	0	0	31	26	0	57	111	0
16:15	0	0	9	0	9	11	32	0	0	43	0	0	0	0	0	0	23	18	0	41	93	0
16:30	0	1	8	0	9	12	43	0	0	55	0	0	0	0	0	0	32	22	0	54	118	0
16:45	0	2	10	0	12	5	35	0	0	40	0	0	0	0	0	0	24	27	0	51	103	0
Total	0	4	40	0	44	34	144	0	0	178	0	0	0	0	0	0	110	93	0	203	425	0
17:00	1	0	8	0	9	3	23	0	0	26	0	0	0	0	0	0	34	31	0	65	100	0
17:15	1	0	14	0	15	3	30	0	0	33	0	0	0	0	0	0	24	18	0	42	90	0
17:30	1	0	15	0	16	2	34	0	0	36	0	0	0	0	0	0	22	23	0	45	97	0
17:45	0	0	9	0	9	5	33	0	0	38	0	0	0	0	0	0	25	18	0	43	90	0
Total	3	0	46	0	49	13	120	0	0	133	0	0	0	0	0	0	105	90	0	195	377	0
Grand Total	4	5	202	0	211	110	491	0	0	601	0	0	0	0	0	0	358	360	0	718	1530	0
Apprch %	1.9%	2.4%	95.7%	0.0%		18.3%	81.7%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	49.9%	50.1%	0.0%			
Total %	0.3%	0.3%	13.2%	0.0%	13.8%	7.2%	32.1%	0.0%	0.0%	39.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	23.4%	23.5%	0.0%	46.9%	100.0%	

AM PEAK HOUR	I-5 SB Ramps Southbound					State Route 16 Westbound					I-5 SB Ramps Northbound					State Route 16 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	0	15	0	15	15	28	0	0	43	0	0	0	0	0	0	17	22	0	39	97
07:45	0	1	28	0	29	12	33	0	0	45	0	0	0	0	0	0	17	27	0	44	118
08:00	0	0	19	0	19	3	40	0	0	43	0	0	0	0	0	0	20	20	0	40	102
08:15	0	0	9	0	9	4	28	0	0	32	0	0	0	0	0	0	25	19	0	44	85
Total Volume	0	1	71	0	72	34	129	0	0	163	0	0	0	0	0	0	79	88	0	167	402
% App Total	0.0%	1.4%	98.6%	0.0%		20.9%	79.1%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	47.3%	52.7%	0.0%		
PHF	.000	.250	.634	.000	.621	.567	.806	.000	.000	.906	.000	.000	.000	.000	.000	.000	.790	.815	.000	.949	.852

PM PEAK HOUR	I-5 SB Ramps Southbound					State Route 16 Westbound					I-5 SB Ramps Northbound					State Route 16 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 16:00 to 17:00																					
Peak Hour For Entire Intersection Begins at 16:00																					
16:00	0	1	13	0	14	6	34	0	0	40	0	0	0	0	0	0	31	26	0	57	111
16:15	0	0	9	0	9	11	32	0	0	43	0	0	0	0	0	0	23	18	0	41	93
16:30	0	1	8	0	9	12	43	0	0	55	0	0	0	0	0	0	32	22	0	54	118
16:45	0	2	10	0	12	5	35	0	0	40	0	0	0	0	0	0	24	27	0	51	103
Total Volume	0	4	40	0	44	34	144	0	0	178	0	0	0	0	0	0	110	93	0	203	425
% App Total	0.0%	9.1%	90.9%	0.0%		19.1%	80.9%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	54.2%	45.8%	0.0%		
PHF	.000	.500	.769	.000	.786	.708	.837	.000	.000	.809	.000	.000	.000	.000	.000	.000	.859	.861	.000	.890	.900

ALL TRAFFIC DATA

Yolo County
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 14-7042-006 I-5 NB Ramps-State Route 16.ppd
Date : 1/28/2014

Unshifted Count = All Vehicles

	I-5 NB Ramps Southbound					State Route 16 Westbound					I-5 NB Ramps Northbound					State Route 16 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	0	0	0	0	0	6	1	0	7	17	0	6	0	23	0	8	3	0	11	41	0
07:15	0	0	0	0	0	0	14	0	0	14	21	0	6	0	27	0	9	4	0	13	54	0
07:30	0	0	0	0	0	0	23	0	0	23	18	0	3	0	21	0	9	8	0	17	61	0
07:45	0	0	0	0	0	0	22	0	0	22	23	1	7	0	31	0	10	7	0	17	70	0
Total	0	0	0	0	0	0	65	1	0	66	79	1	22	0	102	0	36	22	0	58	226	0
08:00	0	0	0	0	0	0	18	0	0	18	25	0	6	0	31	0	16	4	0	20	69	0
08:15	0	0	0	0	0	0	16	1	0	17	17	0	6	0	23	0	15	9	0	24	64	0
08:30	0	0	0	0	0	0	13	0	0	13	10	0	11	0	21	0	18	6	0	24	58	0
08:45	0	0	0	0	0	0	29	0	0	29	17	0	6	0	23	0	11	7	0	18	70	0
Total	0	0	0	0	0	0	76	1	0	77	69	0	29	0	98	0	60	26	0	86	261	0
16:00	0	0	0	0	0	0	18	1	0	19	22	0	6	0	28	0	18	13	0	31	78	0
16:15	0	0	0	0	0	0	24	0	0	24	20	0	16	0	36	0	16	8	0	24	84	0
16:30	0	0	0	0	0	0	20	1	0	21	33	0	13	0	46	0	17	15	0	32	99	0
16:45	0	0	0	0	0	0	15	0	0	15	25	0	11	0	36	0	16	7	0	23	74	0
Total	0	0	0	0	0	0	77	2	0	79	100	0	46	0	146	0	67	43	0	110	335	0
17:00	0	0	0	0	0	0	8	0	0	8	21	0	5	0	26	0	19	16	0	35	69	0
17:15	0	0	0	0	0	0	9	2	0	11	21	0	6	0	27	0	18	8	0	26	64	0
17:30	0	0	0	0	0	0	11	0	0	11	26	0	10	0	36	0	17	4	0	21	68	0
17:45	0	0	0	0	0	0	15	2	0	17	22	0	3	0	25	0	17	10	0	27	69	0
Total	0	0	0	0	0	0	43	4	0	47	90	0	24	0	114	0	71	38	0	109	270	0
Grand Total	0	0	0	0	0	0	261	8	0	269	338	1	121	0	460	0	234	129	0	363	1092	0
Apprch %	0.0%	0.0%	0.0%	0.0%		0.0%	97.0%	3.0%	0.0%		73.5%	0.2%	26.3%	0.0%		0.0%	64.5%	35.5%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	23.9%	0.7%	0.0%	24.6%	31.0%	0.1%	11.1%	0.0%	42.1%	0.0%	21.4%	11.8%	0.0%	33.2%	100.0%	

AM PEAK HOUR	I-5 NB Ramps Southbound					State Route 16 Westbound					I-5 NB Ramps Northbound					State Route 16 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	0	0	0	0	0	23	0	0	23	18	0	3	0	21	0	9	8	0	17	61
07:45	0	0	0	0	0	0	22	0	0	22	23	1	7	0	31	0	10	7	0	17	70
08:00	0	0	0	0	0	0	18	0	0	18	25	0	6	0	31	0	16	4	0	20	69
08:15	0	0	0	0	0	0	16	1	0	17	17	0	6	0	23	0	15	9	0	24	64
Total Volume	0	0	0	0	0	0	79	1	0	80	83	1	22	0	106	0	50	28	0	78	264
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	98.8%	1.3%	0.0%		78.3%	0.9%	20.8%	0.0%		0.0%	64.1%	35.9%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.859	.250	.000	.870	.830	.250	.786	.000	.855	.000	.781	.778	.000	.813	.943

PM PEAK HOUR	I-5 NB Ramps Southbound					State Route 16 Westbound					I-5 NB Ramps Northbound					State Route 16 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 16:00 to 17:00																					
Peak Hour For Entire Intersection Begins at 16:00																					
16:00	0	0	0	0	0	0	18	1	0	19	22	0	6	0	28	0	18	13	0	31	78
16:15	0	0	0	0	0	0	24	0	0	24	20	0	16	0	36	0	16	8	0	24	84
16:30	0	0	0	0	0	0	20	1	0	21	33	0	13	0	46	0	17	15	0	32	99
16:45	0	0	0	0	0	0	15	0	0	15	25	0	11	0	36	0	16	7	0	23	74
Total Volume	0	0	0	0	0	0	77	2	0	79	100	0	46	0	146	0	67	43	0	110	335
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	97.5%	2.5%	0.0%		68.5%	0.0%	31.5%	0.0%		0.0%	60.9%	39.1%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.802	.500	.000	.823	.758	.000	.719	.000	.793	.000	.931	.717	.000	.859	.846

APPENDIX B: INTERSECTION LOS TECHNICAL CALCULATIONS



Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	212	116	4	232	61	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	87	87	87	90	90	90
Heavy Vehicles, %	2	3	2	2	7	13	2	2	2
Mvmt Flow	0	249	136	5	267	70	0	0	0

Major/Minor	Major1			Major2		
Conflicting Flow All	267	0	0	386	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	1297	-	-	1172	-	0
Stage 1	-	-	-	-	-	0
Stage 2	-	-	-	-	-	0
Platoon blocked, %		-	-		-	
Mov Cap-1 Maneuver	1297	-	-	1172	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB
HCM Control Delay, s	0	0.1
HCM LOS		

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	1297	-	-	1172	-	383	750
HCM Lane V/C Ratio	-	-	-	0.004	-	0.019	0.017
HCM Control Delay (s)	0	-	-	8.1	0	14.6	9.9
HCM Lane LOS	A	-	-	A	A	B	A
HCM 95th %tile Q(veh)	0	-	-	0	-	0.1	0.1

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	5	0	9
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	30
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	70	70	70
Heavy Vehicles, %	60	2	11
Mvmt Flow	7	0	13

Major/Minor	Minor2		
Conflicting Flow All	594	662	267
Stage 1	276	276	-
Stage 2	318	386	-
Critical Hdwy	7	6.52	6.31
Critical Hdwy Stg 1	6	5.52	-
Critical Hdwy Stg 2	6	5.52	-
Follow-up Hdwy	4.04	4.018	3.399
Pot Cap-1 Maneuver	385	382	750
Stage 1	654	682	-
Stage 2	624	610	-
Platoon blocked, %			
Mov Cap-1 Maneuver	383	0	750
Mov Cap-2 Maneuver	383	0	-
Stage 1	651	0	-
Stage 2	624	0	-

Approach	SB
HCM Control Delay, s	11.6
HCM LOS	B

Minor Lane/Major Mvmt

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	207	10	0	228	10	69	1	30	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1828	1900	0	1727	1462	1900	1776	1681			
Adj Flow Rate, veh/h	0	235	0	0	296	13	95	1	41			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.88	0.88	0.88	0.77	0.77	0.77	0.73	0.73	0.73			
Percent Heavy Veh, %	0	4	4	0	10	30	13	100	13			
Cap, veh/h	0	737	0	0	697	501	333	4	285			
Arrive On Green	0.00	0.40	0.00	0.00	0.40	0.40	0.20	0.20	0.20			
Sat Flow, veh/h	0	1828	0	0	1727	1242	1675	18	1429			
Grp Volume(v), veh/h	0	235	0	0	296	13	96	0	41			
Grp Sat Flow(s),veh/h/ln	0	1828	0	0	1727	1242	1692	0	1429			
Q Serve(g_s), s	0.0	2.1	0.0	0.0	3.0	0.2	1.2	0.0	0.6			
Cycle Q Clear(g_c), s	0.0	2.1	0.0	0.0	3.0	0.2	1.2	0.0	0.6			
Prop In Lane	0.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	0	737	0	0	697	501	337	0	285			
V/C Ratio(X)	0.00	0.32	0.00	0.00	0.42	0.03	0.28	0.00	0.14			
Avail Cap(c_a), veh/h	0	3029	0	0	2861	2058	1051	0	888			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	4.9	0.0	0.0	5.2	4.3	8.2	0.0	8.0			
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.2	0.0	0.2	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			
%ile BackOfQ(50%),veh/ln	0.0	1.1	0.0	0.0	1.4	0.1	0.5	0.0	0.2			
LnGrp Delay(d),s/veh	0.0	5.0	0.0	0.0	5.3	4.4	8.4	0.0	8.1			
LnGrp LOS		A			A	A	A		A			
Approach Vol, veh/h		235			309			137				
Approach Delay, s/veh		5.0			5.3			8.3				
Approach LOS		A			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		15.2				15.2		8.9
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		4.1				5.0		3.2
Green Ext Time (p_c), s		0.8				0.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	5.8
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	11	386	11	3	208	2	4	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	76	76	76	70	70	70
Heavy Vehicles, %	18	2	2	2	7	2	25	33	2
Mvmt Flow	14	482	14	4	274	3	6	9	9

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	276	0	0	496	0	0	804	801	489
Stage 1	-	-	-	-	-	-	517	517	-
Stage 2	-	-	-	-	-	-	287	284	-
Critical Hdwy	4.28	-	-	4.12	-	-	7.35	6.83	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.35	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.35	5.83	-
Follow-up Hdwy	2.362	-	-	2.218	-	-	3.725	4.297	3.318
Pot Cap-1 Maneuver	1200	-	-	1068	-	-	276	285	579
Stage 1	-	-	-	-	-	-	501	486	-
Stage 2	-	-	-	-	-	-	673	624	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1200	-	-	1068	-	-	268	279	579
Mov Cap-2 Maneuver	-	-	-	-	-	-	268	279	-
Stage 1	-	-	-	-	-	-	493	478	-
Stage 2	-	-	-	-	-	-	662	622	-

Approach	EB	WB	NB
HCM Control Delay, s	0.2	0.1	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	342	1200	-	-	1068	-	-	354
HCM Lane V/C Ratio	0.067	0.011	-	-	0.004	-	-	0.04
HCM Control Delay (s)	16.3	8	0	-	8.4	0	-	15.6
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	4	2	4
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	70	70	70
Heavy Vehicles, %	25	50	2
Mvmt Flow	6	3	6

Major/Minor	Minor2		
Conflicting Flow All	808	807	275
Stage 1	283	283	-
Stage 2	525	524	-
Critical Hdwy	7.35	7	6.22
Critical Hdwy Stg 1	6.35	6	-
Critical Hdwy Stg 2	6.35	6	-
Follow-up Hdwy	3.725	4.45	3.318
Pot Cap-1 Maneuver	274	266	764
Stage 1	677	598	-
Stage 2	496	459	-
Platoon blocked, %			
Mov Cap-1 Maneuver	260	261	764
Mov Cap-2 Maneuver	260	261	-
Stage 1	666	596	-
Stage 2	472	452	-

Approach	SB
HCM Control Delay, s	15.6
HCM LOS	C

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	56	376	5	8	209	1	2	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	89	89	89	70	70	70
Heavy Vehicles, %	2	2	40	13	5	100	100	25	20
Mvmt Flow	64	432	6	9	235	1	3	6	7

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	236	0	0	438	0	0	850	818	435
Stage 1	-	-	-	-	-	-	564	564	-
Stage 2	-	-	-	-	-	-	286	254	-
Critical Hdwy	4.12	-	-	4.23	-	-	8.1	6.75	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	5.75	-
Follow-up Hdwy	2.218	-	-	2.317	-	-	4.4	4.225	3.48
Pot Cap-1 Maneuver	1331	-	-	1066	-	-	194	286	585
Stage 1	-	-	-	-	-	-	372	473	-
Stage 2	-	-	-	-	-	-	552	657	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1331	-	-	1066	-	-	169	270	585
Mov Cap-2 Maneuver	-	-	-	-	-	-	169	270	-
Stage 1	-	-	-	-	-	-	354	450	-
Stage 2	-	-	-	-	-	-	503	651	-

Approach	EB	WB	NB
HCM Control Delay, s	1	0.3	17.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	313	1331	-	-	1066	-	-	632
HCM Lane V/C Ratio	0.05	0.048	-	-	0.008	-	-	0.108
HCM Control Delay (s)	17.1	7.8	-	-	8.4	-	-	11.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	3	6	51
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	88	88	88
Heavy Vehicles, %	2	2	2
Mvmt Flow	3	7	58

Major/Minor	Minor2		
Conflicting Flow All	823	820	235
Stage 1	253	253	-
Stage 2	570	567	-
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	292	310	804
Stage 1	751	698	-
Stage 2	506	507	-
Platoon blocked, %			
Mov Cap-1 Maneuver	272	293	804
Mov Cap-2 Maneuver	272	293	-
Stage 1	715	692	-
Stage 2	470	483	-

Approach	SB
HCM Control Delay, s	11.4
HCM LOS	B

Minor Lane/Major Mvmt

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	0	10	1	0	59	7	0	0	1	1	60
Peak Hour Factor	0.92	0.70	0.70	0.70	0.92	0.87	0.87	0.87	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	40	2	2	2	43	2	2	2	2	5
Mvmt Flow	0	0	14	1	0	68	8	0	0	1	1	66
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.8	7.7	6.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	89%	100%
Vol Thru, %	2%	91%	11%	0%
Vol Right, %	97%	9%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	11	66	1
LT Vol	1	10	7	0
Through Vol	60	1	0	0
RT Vol	1	0	59	1
Lane Flow Rate	68	16	76	1
Geometry Grp	1	1	1	1
Degree of Util (X)	0.067	0.021	0.089	0.002
Departure Headway (Hd)	3.515	4.706	4.247	4.346
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1009	760	845	817
Service Time	1.572	2.739	2.266	2.408
HCM Lane V/C Ratio	0.067	0.021	0.09	0.001
HCM Control Delay	6.8	7.8	7.7	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.3	0

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	1	0	0
Peak Hour Factor	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	0	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.4
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	60	7	23	67	1	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	80	80	70	70
Heavy Vehicles, %	5	29	2	6	2	11
Mvmt Flow	86	10	29	84	1	39

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	96	0	232	91
Stage 1	-	-	-	-	91	-
Stage 2	-	-	-	-	141	-
Critical Hdwy	-	-	4.12	-	6.42	6.31
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.399
Pot Cap-1 Maneuver	-	-	1498	-	756	942
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	886	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1498	-	741	942
Mov Cap-2 Maneuver	-	-	-	-	741	-
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	868	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	933	-	-	1498	-
HCM Lane V/C Ratio	0.043	-	-	0.019	-
HCM Control Delay (s)	9	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	22	63	13	89	59	12	7	122	107	15	161	27
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	1743	1767	1900	1827	1829	1900	1863	1775	1900	1863	1842	1900
Adj Flow Rate, veh/h	27	77	16	116	77	16	9	149	130	20	218	36
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.82	0.82	0.82	0.77	0.77	0.77	0.82	0.82	0.82	0.74	0.74	0.74
Percent Heavy Veh, %	9	6	6	4	3	3	2	8	8	2	3	3
Cap, veh/h	76	164	34	227	295	61	25	188	164	53	355	59
Arrive On Green	0.05	0.12	0.12	0.13	0.20	0.20	0.01	0.21	0.21	0.03	0.23	0.23
Sat Flow, veh/h	1660	1420	295	1740	1470	305	1774	876	764	1774	1542	255
Grp Volume(v), veh/h	27	0	93	116	0	93	9	0	279	20	0	254
Grp Sat Flow(s),veh/h/ln	1660	0	1715	1740	0	1775	1774	0	1640	1774	0	1797
Q Serve(g_s), s	0.6	0.0	1.9	2.3	0.0	1.7	0.2	0.0	6.1	0.4	0.0	4.8
Cycle Q Clear(g_c), s	0.6	0.0	1.9	2.3	0.0	1.7	0.2	0.0	6.1	0.4	0.0	4.8
Prop In Lane	1.00		0.17	1.00		0.17	1.00		0.47	1.00		0.14
Lane Grp Cap(c), veh/h	76	0	198	227	0	356	25	0	352	53	0	414
V/C Ratio(X)	0.36	0.00	0.47	0.51	0.00	0.26	0.35	0.00	0.79	0.37	0.00	0.61
Avail Cap(c_a), veh/h	881	0	1364	923	0	1413	941	0	1740	941	0	1907
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	17.4	0.0	15.6	15.3	0.0	12.7	18.4	0.0	14.0	17.9	0.0	13.0
Incr Delay (d2), s/veh	1.0	0.0	0.6	0.7	0.0	0.1	3.1	0.0	1.5	1.6	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	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.9	1.2	0.0	0.8	0.1	0.0	2.9	0.2	0.0	2.4
LnGrp Delay(d),s/veh	18.5	0.0	16.2	15.9	0.0	12.9	21.5	0.0	15.6	19.5	0.0	13.6
LnGrp LOS	B		B	B		B	C		B	B		B
Approach Vol, veh/h		120			209			288			274	
Approach Delay, s/veh		16.7			14.6			15.7			14.0	
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	5.2	14.1	9.0	9.4	4.6	14.7	5.8	12.6
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	4.1	* 5
Max Green Setting (Gmax), s	20.0	40.0	20.0	* 30	20.0	40.0	20.0	* 30
Max Q Clear Time (g_c+I1), s	2.4	8.1	4.3	3.9	2.2	6.8	2.6	3.7
Green Ext Time (p_c), s	0.0	0.5	0.0	0.3	0.0	0.5	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	15.1
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	79	88	34	129	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	91	91	91	70	70	70
Heavy Vehicles, %	2	5	11	2	5	2	2	2	2
Mvmt Flow	0	83	93	37	142	0	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	142	0	0	176	0	0	346	345	129
Stage 1	-	-	-	-	-	-	129	129	-
Stage 2	-	-	-	-	-	-	217	216	-
Critical Hdwy	4.12	-	-	4.12	-	-	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	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1441	-	-	1400	-	-	608	578	921
Stage 1	-	-	-	-	-	-	875	789	-
Stage 2	-	-	-	-	-	-	785	724	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1441	-	-	1400	-	-	527	561	921
Mov Cap-2 Maneuver	-	-	-	-	-	-	527	561	-
Stage 1	-	-	-	-	-	-	875	789	-
Stage 2	-	-	-	-	-	-	676	703	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1441	-	-	1400	-	-	528	906
HCM Lane V/C Ratio	-	-	-	-	0.027	-	-	0.003	0.112
HCM Control Delay (s)	0	0	-	-	7.6	0	-	11.8	9.5
HCM Lane LOS	A	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0	0.4

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	0	1	71
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	25
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	70	70	70
Heavy Vehicles, %	2	2	2
Mvmt Flow	0	1	101

Major/Minor	Minor2		
Conflicting Flow All	345	392	142
Stage 1	216	216	-
Stage 2	129	176	-
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	609	544	906
Stage 1	786	724	-
Stage 2	875	753	-
Platoon blocked, %			
Mov Cap-1 Maneuver	596	528	906
Mov Cap-2 Maneuver	596	528	-
Stage 1	786	703	-
Stage 2	875	753	-

Approach	SB
HCM Control Delay, s	9.5
HCM LOS	A

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	51	28	0	80	1	83	1	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	87	87	87	86	86	86
Heavy Vehicles, %	2	4	7	2	3	2	4	2	2
Mvmt Flow	0	63	35	0	92	1	97	1	26

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	92	0	-	63	0	0	155	155	63
Stage 1	-	-	-	-	-	-	63	63	-
Stage 2	-	-	-	-	-	-	92	92	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.44	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.44	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.44	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.536	4.018	3.318
Pot Cap-1 Maneuver	1503	-	0	1540	-	0	832	737	1002
Stage 1	-	-	0	-	-	0	955	842	-
Stage 2	-	-	0	-	-	0	927	819	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1503	-	-	1540	-	-	832	0	1002
Mov Cap-2 Maneuver	-	-	-	-	-	-	832	0	-
Stage 1	-	-	-	-	-	-	955	0	-
Stage 2	-	-	-	-	-	-	927	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	863	1503	-	1540	-
HCM Lane V/C Ratio	0.143	-	-	-	-
HCM Control Delay (s)	9.9	0	-	0	-
HCM Lane LOS	A	A	-	A	-
HCM 95th %tile Q(veh)	0.5	0	-	0	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	0
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	70	70	70
Heavy Vehicles, %	2	2	2
Mvmt Flow	0	0	0

Major/Minor	
Conflicting Flow All	
Stage 1	
Stage 2	
Critical Hdwy	
Critical Hdwy Stg 1	
Critical Hdwy Stg 2	
Follow-up Hdwy	
Pot Cap-1 Maneuver	
Stage 1	
Stage 2	
Platoon blocked, %	
Mov Cap-1 Maneuver	
Mov Cap-2 Maneuver	
Stage 1	
Stage 2	

Approach	
HCM Control Delay, s	
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	292	210	0	464	50	0	0	0	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	90	90	90	70	70	70	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	40	2	2
Mvmt Flow	0	332	239	0	516	56	0	0	0	6	0	6

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	516	0	0	570	0	0	967	1086	516
Stage 1	-	-	-	-	-	-	516	516	-
Stage 2	-	-	-	-	-	-	451	570	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.8	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.86	4.018	3.318
Pot Cap-1 Maneuver	1050	-	-	1002	-	0	241	216	559
Stage 1	-	-	-	-	-	0	529	534	-
Stage 2	-	-	-	-	-	0	569	505	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	1050	-	-	1002	-	-	241	0	559
Mov Cap-2 Maneuver	-	-	-	-	-	-	241	0	-
Stage 1	-	-	-	-	-	-	529	0	-
Stage 2	-	-	-	-	-	-	569	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	1050	-	-	1002	-	241	559
HCM Lane V/C Ratio	-	-	-	-	-	0.025	0.011
HCM Control Delay (s)	0	-	-	0	-	20.3	11.5
HCM Lane LOS	A	-	-	A	-	C	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.1	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	279	18	0	298	11	216	0	69	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1852	1900	0	1863	1863	1900	1863	1845			
Adj Flow Rate, veh/h	0	307	0	0	314	12	237	0	76			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.91	0.91	0.91	0.95	0.95	0.95	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	2	3	2	3			
Cap, veh/h	0	687	0	0	691	587	479	0	423			
Arrive On Green	0.00	0.37	0.00	0.00	0.37	0.37	0.27	0.00	0.27			
Sat Flow, veh/h	0	1852	0	0	1863	1583	1774	0	1568			
Grp Volume(v), veh/h	0	307	0	0	314	12	237	0	76			
Grp Sat Flow(s),veh/h/ln	0	1852	0	0	1863	1583	1774	0	1568			
Q Serve(g_s), s	0.0	3.3	0.0	0.0	3.4	0.1	3.0	0.0	1.0			
Cycle Q Clear(g_c), s	0.0	3.3	0.0	0.0	3.4	0.1	3.0	0.0	1.0			
Prop In Lane	0.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	687	0	0	691	587	479	0	423			
V/C Ratio(X)	0.00	0.45	0.00	0.00	0.45	0.02	0.49	0.00	0.18			
Avail Cap(c_a), veh/h	0	2771	0	0	2788	2370	996	0	880			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	6.3	0.0	0.0	6.4	5.3	8.2	0.0	7.5			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.2	0.0	0.3	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			
%ile BackOfQ(50%),veh/ln	0.0	1.7	0.0	0.0	1.8	0.1	1.5	0.0	0.4			
LnGrp Delay(d),s/veh	0.0	6.5	0.0	0.0	6.5	5.3	8.5	0.0	7.6			
LnGrp LOS		A			A	A	A		A			
Approach Vol, veh/h		307			326			313				
Approach Delay, s/veh		6.5			6.5			8.3				
Approach LOS		A			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		15.4				15.4		11.3
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		5.3				5.4		5.0
Green Ext Time (p_c), s		0.9				0.9		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		7.1
HCM 2010 LOS		A

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	386	11	12	449	0	17	6	9	4	4	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	95	95	95	70	70	70	82	82	82
Heavy Vehicles, %	33	2	18	8	2	2	6	2	2	2	25	2
Mvmt Flow	4	482	14	13	473	0	24	9	13	5	5	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	473	0	0	496	0	0	1006	995	489	1006	1002	473
Stage 1	-	-	-	-	-	-	497	497	-	498	498	-
Stage 2	-	-	-	-	-	-	509	498	-	508	504	-
Critical Hdwy	4.43	-	-	4.18	-	-	7.16	6.52	6.22	7.12	6.75	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.12	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.12	5.75	-
Follow-up Hdwy	2.497	-	-	2.272	-	-	3.554	4.018	3.318	3.518	4.225	3.318
Pot Cap-1 Maneuver	945	-	-	1037	-	-	216	245	579	220	221	591
Stage 1	-	-	-	-	-	-	548	545	-	554	508	-
Stage 2	-	-	-	-	-	-	539	544	-	547	505	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	945	-	-	1037	-	-	202	239	579	206	216	591
Mov Cap-2 Maneuver	-	-	-	-	-	-	202	239	-	206	216	-
Stage 1	-	-	-	-	-	-	545	542	-	551	499	-
Stage 2	-	-	-	-	-	-	508	535	-	523	502	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	22.1	15.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	256	945	-	-	1037	-	-	363
HCM Lane V/C Ratio	0.179	0.004	-	-	0.012	-	-	0.077
HCM Control Delay (s)	22.1	8.8	0	-	8.5	0	-	15.7
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	41	434	2	2	458	5	1	5	7	1	6	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	95	95	95	70	70	70	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	523	2	2	482	5	1	7	10	1	7	88

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	487	0	0	525	0	0	1160	1115	524	1120	1113	485
Stage 1	-	-	-	-	-	-	623	623	-	489	489	-
Stage 2	-	-	-	-	-	-	537	492	-	631	624	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1076	-	-	1042	-	-	172	208	553	184	208	582
Stage 1	-	-	-	-	-	-	474	478	-	561	549	-
Stage 2	-	-	-	-	-	-	528	548	-	469	478	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1076	-	-	1042	-	-	137	198	553	169	198	582
Mov Cap-2 Maneuver	-	-	-	-	-	-	137	198	-	169	198	-
Stage 1	-	-	-	-	-	-	452	456	-	535	548	-
Stage 2	-	-	-	-	-	-	441	547	-	433	456	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	18.4	14
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	288	1076	-	-	1042	-	-	497
HCM Lane V/C Ratio	0.064	0.046	-	-	0.002	-	-	0.194
HCM Control Delay (s)	18.4	8.5	-	-	8.5	-	-	14
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.7

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	0	3	1	0	72	4	2	0	0	0	46	0	2	0	0
Peak Hour Factor	0.92	0.70	0.70	0.70	0.92	0.85	0.85	0.85	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	4	1	0	85	5	2	0	0	0	66	0	3	0	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	7.8	6.8	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	92%	100%
Vol Thru, %	0%	75%	5%	0%
Vol Right, %	100%	25%	3%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	4	78	2
LT Vol	0	3	4	0
Through Vol	46	1	2	0
RT Vol	0	0	72	2
Lane Flow Rate	66	6	92	3
Geometry Grp	1	1	1	1
Degree of Util (X)	0.064	0.006	0.108	0.003
Departure Headway (Hd)	3.506	3.974	4.227	4.355
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1013	898	851	816
Service Time	1.559	2.008	2.24	2.414
HCM Lane V/C Ratio	0.065	0.007	0.108	0.004
HCM Control Delay	6.8	7	7.8	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0	0.4	0

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	54	0	26	87	4	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	86	86	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	0	30	101	6	44

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	72	0	234	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	162	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1528	-	754	990
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	867	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1528	-	738	990
Mov Cap-2 Maneuver	-	-	-	-	738	-
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	849	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	953	-	-	1528	-
HCM Lane V/C Ratio	0.052	-	-	0.02	-
HCM Control Delay (s)	9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	27	55	14	103	66	16	14	180	96	12	120	37
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1850	1900	1759	1831	1900
Adj Flow Rate, veh/h	36	73	19	113	73	18	17	214	114	13	130	40
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.75	0.75	0.75	0.91	0.91	0.91	0.84	0.84	0.84	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	8	4	4
Cap, veh/h	181	163	42	227	168	41	46	268	143	34	309	95
Arrive On Green	0.10	0.11	0.11	0.13	0.12	0.12	0.03	0.24	0.24	0.02	0.23	0.23
Sat Flow, veh/h	1774	1426	371	1774	1443	356	1774	1136	605	1675	1344	414
Grp Volume(v), veh/h	36	0	92	113	0	91	17	0	328	13	0	170
Grp Sat Flow(s),veh/h/ln	1774	0	1797	1774	0	1799	1774	0	1742	1675	0	1758
Q Serve(g_s), s	0.7	0.0	1.8	2.3	0.0	1.8	0.4	0.0	6.8	0.3	0.0	3.2
Cycle Q Clear(g_c), s	0.7	0.0	1.8	2.3	0.0	1.8	0.4	0.0	6.8	0.3	0.0	3.2
Prop In Lane	1.00		0.21	1.00		0.20	1.00		0.35	1.00		0.24
Lane Grp Cap(c), veh/h	181	0	205	227	0	210	46	0	411	34	0	405
V/C Ratio(X)	0.20	0.00	0.45	0.50	0.00	0.43	0.37	0.00	0.80	0.38	0.00	0.42
Avail Cap(c_a), veh/h	886	0	1409	927	0	1411	927	0	1821	876	0	1838
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	15.7	0.0	15.8	15.5	0.0	15.7	18.3	0.0	13.8	18.5	0.0	12.6
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.6	0.0	0.5	1.8	0.0	1.4	2.6	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	0.4	0.0	0.9	1.1	0.0	0.9	0.2	0.0	3.3	0.2	0.0	1.5
LnGrp Delay(d),s/veh	15.9	0.0	16.4	16.2	0.0	16.3	20.1	0.0	15.1	21.1	0.0	12.8
LnGrp LOS	B		B	B		B	C		B	C		B
Approach Vol, veh/h		128			204			345			183	
Approach Delay, s/veh		16.3			16.2			15.4			13.4	
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	15.0	9.0	9.4	5.1	14.8	8.9	9.5
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	* 5	* 5
Max Green Setting (Gmax), s	20.0	40.0	20.0	* 30	20.0	40.0	* 19	* 30
Max Q Clear Time (g_c+I1), s	2.3	8.8	4.3	3.8	2.4	5.2	2.7	3.8
Green Ext Time (p_c), s	0.0	0.4	0.0	0.1	0.0	0.4	0.1	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	110	93	34	144	0	0	0	0	0	4	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	81	81	81	70	70	70	79	79	79
Heavy Vehicles, %	2	2	2	6	6	2	2	2	2	2	75	3
Mvmt Flow	0	124	104	42	178	0	0	0	0	0	5	51

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	178	0	0	228	0	0	440	438	176	438	490	178
Stage 1	-	-	-	-	-	-	176	176	-	262	262	-
Stage 2	-	-	-	-	-	-	264	262	-	176	228	-
Critical Hdwy	4.12	-	-	4.16	-	-	7.12	6.52	6.22	7.12	7.25	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	6.25	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	6.25	-
Follow-up Hdwy	2.218	-	-	2.254	-	-	3.518	4.018	3.318	3.518	4.675	3.327
Pot Cap-1 Maneuver	1398	-	-	1317	-	-	527	512	867	529	388	862
Stage 1	-	-	-	-	-	-	826	753	-	743	576	-
Stage 2	-	-	-	-	-	-	741	691	-	826	599	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1398	-	-	1317	-	-	478	494	867	515	374	862
Mov Cap-2 Maneuver	-	-	-	-	-	-	478	494	-	515	374	-
Stage 1	-	-	-	-	-	-	826	753	-	743	556	-
Stage 2	-	-	-	-	-	-	667	667	-	826	599	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.5	0	9.9
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1398	-	-	1317	-	-	374	862
HCM Lane V/C Ratio	-	-	-	-	0.032	-	-	0.014	0.059
HCM Control Delay (s)	0	0	-	-	7.8	0	-	14.8	9.4
HCM Lane LOS	A	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0	0.2

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	67	43	0	78	2	100	0	46	0	0	0
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	82	82	82	79	79	79	70	70	70
Heavy Vehicles, %	2	2	2	2	8	2	4	2	7	2	2	2
Mvmt Flow	0	78	50	0	95	2	127	0	58	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	95	0	-	78	0	0	173	173	78
Stage 1	-	-	-	-	-	-	78	78	-
Stage 2	-	-	-	-	-	-	95	95	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.44	6.52	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	5.44	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.44	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.536	4.018	3.363
Pot Cap-1 Maneuver	1499	-	0	1520	-	0	812	720	969
Stage 1	-	-	0	-	-	0	940	830	-
Stage 2	-	-	0	-	-	0	924	816	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1499	-	-	1520	-	-	812	0	969
Mov Cap-2 Maneuver	-	-	-	-	-	-	812	0	-
Stage 1	-	-	-	-	-	-	940	0	-
Stage 2	-	-	-	-	-	-	924	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	856	1499	-	1520	-
HCM Lane V/C Ratio	0.216	-	-	-	-
HCM Control Delay (s)	10.4	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	0.8	0	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	214	116	4	234	71	0	0	0	8	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	87	87	87	90	90	90	70	70	70
Heavy Vehicles, %	2	4	2	2	8	25	2	2	2	75	2	11
Mvmt Flow	0	252	136	5	269	82	0	0	0	11	0	13

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	269	0	0	388	0	0	598	666	269
Stage 1	-	-	-	-	-	-	278	278	-
Stage 2	-	-	-	-	-	-	320	388	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.15	6.52	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	4.175	4.018	3.399
Pot Cap-1 Maneuver	1295	-	-	1170	-	0	365	380	748
Stage 1	-	-	-	-	-	0	627	680	-
Stage 2	-	-	-	-	-	0	597	609	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	1295	-	-	1170	-	-	363	0	748
Mov Cap-2 Maneuver	-	-	-	-	-	-	363	0	-
Stage 1	-	-	-	-	-	-	624	0	-
Stage 2	-	-	-	-	-	-	597	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.1	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	1295	-	-	1170	-	363	748
HCM Lane V/C Ratio	-	-	-	0.004	-	0.031	0.017
HCM Control Delay (s)	0	-	-	8.1	0	15.2	9.9
HCM Lane LOS	A	-	-	A	A	C	A
HCM 95th %tile Q(veh)	0	-	-	0	-	0.1	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	212	10	0	240	13	69	1	40	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1779	1900	0	1667	1301	1900	1776	1407			
Adj Flow Rate, veh/h	0	241	0	0	312	17	95	1	55			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.88	0.88	0.88	0.77	0.77	0.77	0.73	0.73	0.73			
Percent Heavy Veh, %	0	7	7	0	14	46	35	100	35			
Cap, veh/h	0	710	0	0	665	442	351	4	251			
Arrive On Green	0.00	0.40	0.00	0.00	0.40	0.40	0.21	0.21	0.21			
Sat Flow, veh/h	0	1779	0	0	1667	1106	1675	18	1196			
Grp Volume(v), veh/h	0	241	0	0	312	17	96	0	55			
Grp Sat Flow(s),veh/h/ln	0	1779	0	0	1667	1106	1692	0	1196			
Q Serve(g_s), s	0.0	2.3	0.0	0.0	3.4	0.2	1.2	0.0	0.9			
Cycle Q Clear(g_c), s	0.0	2.3	0.0	0.0	3.4	0.2	1.2	0.0	0.9			
Prop In Lane	0.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	0	710	0	0	665	442	355	0	251			
V/C Ratio(X)	0.00	0.34	0.00	0.00	0.47	0.04	0.27	0.00	0.22			
Avail Cap(c_a), veh/h	0	2901	0	0	2717	1803	1035	0	731			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	5.1	0.0	0.0	5.4	4.5	8.1	0.0	8.0			
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.2	0.0	0.2	0.0	0.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	1.1	0.0	0.0	1.5	0.1	0.5	0.0	0.3			
LnGrp Delay(d),s/veh	0.0	5.2	0.0	0.0	5.6	4.5	8.3	0.0	8.2			
LnGrp LOS		A			A	A	A		A			
Approach Vol, veh/h		241			329			151				
Approach Delay, s/veh		5.2			5.6			8.2				
Approach LOS		A			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		15.3				15.3		9.2
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		4.3				5.4		3.2
Green Ext Time (p_c), s		0.8				0.8		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		6.0
HCM 2010 LOS		A

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	11	401	11	3	223	2	4	6	6	4	2	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	76	76	76	70	70	70	70	70	70
Heavy Vehicles, %	18	6	2	2	13	2	25	33	2	25	50	2
Mvmt Flow	14	501	14	4	293	3	6	9	9	6	3	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	296	0	0	515	0	0	843	840	508	847	846	295
Stage 1	-	-	-	-	-	-	536	536	-	303	303	-
Stage 2	-	-	-	-	-	-	307	304	-	544	543	-
Critical Hdwy	4.28	-	-	4.12	-	-	7.35	6.83	6.22	7.35	7	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.35	5.83	-	6.35	6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.35	5.83	-	6.35	6	-
Follow-up Hdwy	2.362	-	-	2.218	-	-	3.725	4.297	3.318	3.725	4.45	3.318
Pot Cap-1 Maneuver	1179	-	-	1051	-	-	259	270	565	257	252	744
Stage 1	-	-	-	-	-	-	489	476	-	660	585	-
Stage 2	-	-	-	-	-	-	656	611	-	484	449	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1179	-	-	1051	-	-	250	264	565	243	246	744
Mov Cap-2 Maneuver	-	-	-	-	-	-	250	264	-	243	246	-
Stage 1	-	-	-	-	-	-	481	468	-	649	582	-
Stage 2	-	-	-	-	-	-	645	608	-	460	441	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	17	16.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	324	1179	-	-	1051	-	-	334
HCM Lane V/C Ratio	0.071	0.012	-	-	0.004	-	-	0.043
HCM Control Delay (s)	17	8.1	0	-	8.4	0	-	16.3
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	71	376	5	8	209	1	2	4	5	3	6	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	89	89	89	70	70	70	88	88	88
Heavy Vehicles, %	23	2	40	13	5	100	100	25	20	2	2	24
Mvmt Flow	82	432	6	9	235	1	3	6	7	3	7	75

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	236	0	0	438	0	0	892	852	435	858	854	235
Stage 1	-	-	-	-	-	-	598	598	-	253	253	-
Stage 2	-	-	-	-	-	-	294	254	-	605	601	-
Critical Hdwy	4.33	-	-	4.23	-	-	8.1	6.75	6.4	7.12	6.52	6.44
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	5.75	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	5.75	-	6.12	5.52	-
Follow-up Hdwy	2.407	-	-	2.317	-	-	4.4	4.225	3.48	3.518	4.018	3.516
Pot Cap-1 Maneuver	1217	-	-	1066	-	-	181	273	585	277	296	753
Stage 1	-	-	-	-	-	-	355	456	-	751	698	-
Stage 2	-	-	-	-	-	-	545	657	-	485	489	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1217	-	-	1066	-	-	151	252	585	253	274	753
Mov Cap-2 Maneuver	-	-	-	-	-	-	151	252	-	253	274	-
Stage 1	-	-	-	-	-	-	331	425	-	700	692	-
Stage 2	-	-	-	-	-	-	482	651	-	441	456	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.3	18	11.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	292	1217	-	-	1066	-	-	618
HCM Lane V/C Ratio	0.054	0.067	-	-	0.008	-	-	0.138
HCM Control Delay (s)	18	8.2	-	-	8.4	-	-	11.8
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0	-	-	0.5

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	0	46	16	0	59	43	0	0	16	1	60	0	1	0	0
Peak Hour Factor	0.92	0.70	0.70	0.70	0.92	0.87	0.87	0.87	0.92	0.91	0.91	0.91	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	87	94	2	2	91	2	2	94	2	5	2	2	2	2
Mvmt Flow	0	0	66	23	0	68	49	0	0	18	1	66	0	1	0	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.5	8.2	9.5	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	21%	0%	58%	100%
Vol Thru, %	1%	74%	42%	0%
Vol Right, %	78%	26%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	77	62	102	1
LT Vol	1	46	43	0
Through Vol	60	16	0	0
RT Vol	16	0	59	1
Lane Flow Rate	85	89	117	1
Geometry Grp	1	1	1	1
Degree of Util (X)	0.132	0.138	0.144	0.002
Departure Headway (Hd)	5.602	5.607	4.424	4.782
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	642	642	814	750
Service Time	3.619	3.62	2.436	2.803
HCM Lane V/C Ratio	0.132	0.139	0.144	0.001
HCM Control Delay	9.5	9.5	8.2	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.5	0.5	0

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	96	7	23	103	1	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	80	80	70	70
Heavy Vehicles, %	41	29	2	39	2	11
Mvmt Flow	137	10	29	129	1	39

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	147	0	328	142
Stage 1	-	-	-	-	142	-
Stage 2	-	-	-	-	186	-
Critical Hdwy	-	-	4.12	-	6.42	6.31
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.399
Pot Cap-1 Maneuver	-	-	1435	-	666	882
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	846	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1435	-	651	882
Mov Cap-2 Maneuver	-	-	-	-	651	-
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	871	-	-	1435	-
HCM Lane V/C Ratio	0.046	-	-	0.02	-
HCM Control Delay (s)	9.3	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	58	63	13	89	59	12	7	122	107	15	161	63
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	1145	1767	1900	1827	1829	1900	1863	1775	1900	1863	1601	1900
Adj Flow Rate, veh/h	71	77	16	116	77	16	9	149	130	20	218	85
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.82	0.82	0.82	0.77	0.77	0.77	0.82	0.82	0.82	0.74	0.74	0.74
Percent Heavy Veh, %	66	6	6	4	3	3	2	8	8	2	3	3
Cap, veh/h	105	163	34	225	216	45	25	199	174	53	267	104
Arrive On Green	0.10	0.11	0.11	0.13	0.15	0.15	0.01	0.23	0.23	0.03	0.24	0.24
Sat Flow, veh/h	1090	1420	295	1740	1470	305	1774	876	764	1774	1097	428
Grp Volume(v), veh/h	71	0	93	116	0	93	9	0	279	20	0	303
Grp Sat Flow(s),veh/h/ln	1090	0	1715	1740	0	1775	1774	0	1640	1774	0	1525
Q Serve(g_s), s	2.4	0.0	2.0	2.4	0.0	1.8	0.2	0.0	6.1	0.4	0.0	7.2
Cycle Q Clear(g_c), s	2.4	0.0	2.0	2.4	0.0	1.8	0.2	0.0	6.1	0.4	0.0	7.2
Prop In Lane	1.00		0.17	1.00		0.17	1.00		0.47	1.00		0.28
Lane Grp Cap(c), veh/h	105	0	196	225	0	261	25	0	373	53	0	371
V/C Ratio(X)	0.67	0.00	0.47	0.52	0.00	0.36	0.35	0.00	0.75	0.38	0.00	0.82
Avail Cap(c_a), veh/h	566	0	1335	903	0	1383	921	0	1703	921	0	1584
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	16.8	0.0	16.0	15.6	0.0	14.8	18.8	0.0	13.8	18.3	0.0	13.8
Incr Delay (d2), s/veh	2.8	0.0	0.7	0.7	0.0	0.3	3.1	0.0	1.1	1.6	0.0	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	0.8	0.0	1.0	1.2	0.0	0.9	0.1	0.0	2.8	0.2	0.0	3.2
LnGrp Delay(d),s/veh	19.6	0.0	16.6	16.3	0.0	15.1	21.9	0.0	15.0	19.9	0.0	15.4
LnGrp LOS	B		B	B		B	C		B	B		B
Approach Vol, veh/h		164			209			288			323	
Approach Delay, s/veh		17.9			15.8			15.2			15.7	
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	5.3	14.8	9.1	9.4	4.7	15.4	7.8	10.7
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	4.1	* 5
Max Green Setting (Gmax), s	20.0	40.0	20.0	* 30	20.0	40.0	20.0	* 30
Max Q Clear Time (g_c+I1), s	4.4	8.1	4.4	4.0	2.2	9.2	4.4	3.8
Green Ext Time (p_c), s	0.0	0.5	0.0	0.3	0.0	0.5	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	81	122	34	163	0	0	0	0	0	1	73
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	91	91	91	70	70	70	70	70	70
Heavy Vehicles, %	2	7	36	2	25	2	2	2	2	2	2	4
Mvmt Flow	0	85	128	37	179	0	0	0	0	0	1	104

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	179	0	0	214	0	0	404	403	149	403	468	179
Stage 1	-	-	-	-	-	-	149	149	-	254	254	-
Stage 2	-	-	-	-	-	-	255	254	-	149	214	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.336
Pot Cap-1 Maneuver	1397	-	-	1356	-	-	557	536	898	558	493	859
Stage 1	-	-	-	-	-	-	854	774	-	750	697	-
Stage 2	-	-	-	-	-	-	749	697	-	854	725	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1397	-	-	1356	-	-	477	520	898	545	478	859
Mov Cap-2 Maneuver	-	-	-	-	-	-	477	520	-	545	478	-
Stage 1	-	-	-	-	-	-	854	774	-	750	676	-
Stage 2	-	-	-	-	-	-	637	676	-	854	725	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.3	0	9.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1397	-	-	1356	-	-	478	859
HCM Lane V/C Ratio	-	-	-	-	0.028	-	-	0.003	0.121
HCM Control Delay (s)	0	0	-	-	7.7	0	-	12.6	9.8
HCM Lane LOS	A	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0	0.4

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	51	30	0	80	1	117	1	22	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	87	87	87	86	86	86	70	70	70
Heavy Vehicles, %	2	4	13	2	3	2	32	2	2	2	2	2
Mvmt Flow	0	63	37	0	92	1	136	1	26	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	92	0	-	63	0	0	155	155	63
Stage 1	-	-	-	-	-	-	63	63	-
Stage 2	-	-	-	-	-	-	92	92	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.72	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.72	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.72	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.788	4.018	3.318
Pot Cap-1 Maneuver	1503	-	0	1540	-	0	771	737	1002
Stage 1	-	-	0	-	-	0	889	842	-
Stage 2	-	-	0	-	-	0	862	819	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1503	-	-	1540	-	-	771	0	1002
Mov Cap-2 Maneuver	-	-	-	-	-	-	771	0	-
Stage 1	-	-	-	-	-	-	889	0	-
Stage 2	-	-	-	-	-	-	862	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	800	1503	-	1540	-
HCM Lane V/C Ratio	0.203	-	-	-	-
HCM Control Delay (s)	10.6	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	0.8	0	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	292	210	0	464	51	0	0	0	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	90	90	90	70	70	70	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	40	2	2
Mvmt Flow	0	332	239	0	516	57	0	0	0	6	0	6

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	516	0	0	570	0	0	967	1086	516
Stage 1	-	-	-	-	-	-	516	516	-
Stage 2	-	-	-	-	-	-	451	570	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.8	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.86	4.018	3.318
Pot Cap-1 Maneuver	1050	-	-	1002	-	0	241	216	559
Stage 1	-	-	-	-	-	0	529	534	-
Stage 2	-	-	-	-	-	0	569	505	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	1050	-	-	1002	-	-	241	0	559
Mov Cap-2 Maneuver	-	-	-	-	-	-	241	0	-
Stage 1	-	-	-	-	-	-	529	0	-
Stage 2	-	-	-	-	-	-	569	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	1050	-	-	1002	-	241	559
HCM Lane V/C Ratio	-	-	-	-	-	0.025	0.011
HCM Control Delay (s)	0	-	-	0	-	20.3	11.5
HCM Lane LOS	A	-	-	A	-	C	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.1	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	279	18	0	299	11	216	0	70	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1853	1900	0	1863	1863	1900	1863	1827			
Adj Flow Rate, veh/h	0	307	0	0	315	12	237	0	77			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.91	0.91	0.91	0.95	0.95	0.95	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	2	4	2	4			
Cap, veh/h	0	687	0	0	691	587	479	0	420			
Arrive On Green	0.00	0.37	0.00	0.00	0.37	0.37	0.27	0.00	0.27			
Sat Flow, veh/h	0	1853	0	0	1863	1583	1774	0	1553			
Grp Volume(v), veh/h	0	307	0	0	315	12	237	0	77			
Grp Sat Flow(s),veh/h/ln	0	1853	0	0	1863	1583	1774	0	1553			
Q Serve(g_s), s	0.0	3.3	0.0	0.0	3.4	0.1	3.0	0.0	1.0			
Cycle Q Clear(g_c), s	0.0	3.3	0.0	0.0	3.4	0.1	3.0	0.0	1.0			
Prop In Lane	0.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	687	0	0	691	587	479	0	420			
V/C Ratio(X)	0.00	0.45	0.00	0.00	0.46	0.02	0.49	0.00	0.18			
Avail Cap(c_a), veh/h	0	2772	0	0	2787	2369	995	0	871			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	6.3	0.0	0.0	6.4	5.3	8.2	0.0	7.5			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.2	0.0	0.3	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			
%ile BackOfQ(50%),veh/ln	0.0	1.7	0.0	0.0	1.8	0.1	1.5	0.0	0.4			
LnGrp Delay(d),s/veh	0.0	6.5	0.0	0.0	6.5	5.3	8.5	0.0	7.6			
LnGrp LOS		A			A	A	A		A			
Approach Vol, veh/h		307			327			314				
Approach Delay, s/veh		6.5			6.5			8.3				
Approach LOS		A			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		15.4				15.4		11.3
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		5.3				5.4		5.0
Green Ext Time (p_c), s		0.9				0.9		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		7.1
HCM 2010 LOS		A

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	387	11	12	450	0	17	6	9	4	4	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	95	95	95	70	70	70	82	82	82
Heavy Vehicles, %	33	2	18	8	2	2	6	2	2	2	25	2
Mvmt Flow	4	484	14	13	474	0	24	9	13	5	5	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	474	0	0	498	0	0	1009	997	491	1008	1004	474
Stage 1	-	-	-	-	-	-	498	498	-	499	499	-
Stage 2	-	-	-	-	-	-	511	499	-	509	505	-
Critical Hdwy	4.43	-	-	4.18	-	-	7.16	6.52	6.22	7.12	6.75	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.12	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.12	5.75	-
Follow-up Hdwy	2.497	-	-	2.272	-	-	3.554	4.018	3.318	3.518	4.225	3.318
Pot Cap-1 Maneuver	944	-	-	1036	-	-	215	244	578	219	221	590
Stage 1	-	-	-	-	-	-	547	544	-	554	507	-
Stage 2	-	-	-	-	-	-	538	544	-	547	504	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	944	-	-	1036	-	-	201	238	578	205	216	590
Mov Cap-2 Maneuver	-	-	-	-	-	-	201	238	-	205	216	-
Stage 1	-	-	-	-	-	-	544	541	-	551	498	-
Stage 2	-	-	-	-	-	-	507	535	-	523	501	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	22.2	15.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	255	944	-	-	1036	-	-	362
HCM Lane V/C Ratio	0.179	0.004	-	-	0.012	-	-	0.077
HCM Control Delay (s)	22.2	8.8	0	-	8.5	0	-	15.8
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	42	434	2	2	458	5	1	5	7	1	6	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	95	95	95	70	70	70	85	85	85
Heavy Vehicles, %	5	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	51	523	2	2	482	5	1	7	10	1	7	89

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	487	0	0	525	0	0	1162	1117	524	1123	1116	485
Stage 1	-	-	-	-	-	-	625	625	-	489	489	-
Stage 2	-	-	-	-	-	-	537	492	-	634	627	-
Critical Hdwy	4.15	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.245	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1061	-	-	1042	-	-	172	207	553	183	208	582
Stage 1	-	-	-	-	-	-	473	477	-	561	549	-
Stage 2	-	-	-	-	-	-	528	548	-	467	476	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1061	-	-	1042	-	-	136	197	553	168	198	582
Mov Cap-2 Maneuver	-	-	-	-	-	-	136	197	-	168	198	-
Stage 1	-	-	-	-	-	-	450	454	-	534	548	-
Stage 2	-	-	-	-	-	-	440	547	-	430	453	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	18.5	14
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	286	1061	-	-	1042	-	-	497
HCM Lane V/C Ratio	0.065	0.048	-	-	0.002	-	-	0.196
HCM Control Delay (s)	18.5	8.6	-	-	8.5	-	-	14
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.7

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	0	4	2	0	72	5	2	0	1	0	46	0	2	0	0
Peak Hour Factor	0.92	0.70	0.70	0.70	0.92	0.85	0.85	0.85	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	25	50	2	2	20	2	2	100	2	2	2	2	2	2
Mvmt Flow	0	0	6	3	0	85	6	2	0	1	0	66	0	3	0	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.5	7.8	8.8	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	91%	100%
Vol Thru, %	0%	67%	6%	0%
Vol Right, %	98%	33%	3%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	47	6	79	2
LT Vol	0	4	5	0
Through Vol	46	2	2	0
RT Vol	1	0	72	2
Lane Flow Rate	67	9	93	3
Geometry Grp	1	1	1	1
Degree of Util (X)	0.097	0.01	0.109	0.003
Departure Headway (Hd)	5.199	4.32	4.232	4.365
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	686	815	837	808
Service Time	3.254	2.417	2.306	2.453
HCM Lane V/C Ratio	0.098	0.011	0.111	0.004
HCM Control Delay	8.8	7.5	7.8	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0	0.4	0

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	55	0	26	88	4	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	86	86	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	73	0	30	102	6	44

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	73	0	236	73
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	163	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1527	-	752	989
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	866	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1527	-	736	989
Mov Cap-2 Maneuver	-	-	-	-	736	-
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	848	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	952	-	-	1527	-
HCM Lane V/C Ratio	0.053	-	-	0.02	-
HCM Control Delay (s)	9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	28	55	14	103	66	16	14	180	96	12	120	38
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	1827	1863	1900	1863	1863	1900	1863	1850	1900	1759	1823	1900
Adj Flow Rate, veh/h	37	73	19	113	73	18	17	214	114	13	130	41
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.75	0.75	0.75	0.91	0.91	0.91	0.84	0.84	0.84	0.92	0.92	0.92
Percent Heavy Veh, %	4	2	2	2	2	2	2	2	2	8	4	4
Cap, veh/h	178	163	42	227	168	41	46	268	143	34	306	97
Arrive On Green	0.10	0.11	0.11	0.13	0.12	0.12	0.03	0.24	0.24	0.02	0.23	0.23
Sat Flow, veh/h	1740	1426	371	1774	1443	356	1774	1136	605	1675	1329	419
Grp Volume(v), veh/h	37	0	92	113	0	91	17	0	328	13	0	171
Grp Sat Flow(s),veh/h/ln	1740	0	1797	1774	0	1799	1774	0	1742	1675	0	1749
Q Serve(g_s), s	0.7	0.0	1.8	2.3	0.0	1.8	0.4	0.0	6.8	0.3	0.0	3.2
Cycle Q Clear(g_c), s	0.7	0.0	1.8	2.3	0.0	1.8	0.4	0.0	6.8	0.3	0.0	3.2
Prop In Lane	1.00		0.21	1.00		0.20	1.00		0.35	1.00		0.24
Lane Grp Cap(c), veh/h	178	0	205	227	0	210	46	0	411	34	0	402
V/C Ratio(X)	0.21	0.00	0.45	0.50	0.00	0.43	0.37	0.00	0.80	0.38	0.00	0.42
Avail Cap(c_a), veh/h	869	0	1409	927	0	1411	927	0	1821	876	0	1828
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	15.8	0.0	15.8	15.5	0.0	15.7	18.3	0.0	13.8	18.5	0.0	12.6
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.6	0.0	0.5	1.8	0.0	1.4	2.6	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	0.4	0.0	0.9	1.1	0.0	0.9	0.2	0.0	3.3	0.2	0.0	1.5
LnGrp Delay(d),s/veh	16.0	0.0	16.4	16.2	0.0	16.3	20.2	0.0	15.1	21.1	0.0	12.8
LnGrp LOS	B		B	B		B	C		B	C		B
Approach Vol, veh/h		129			204			345			184	
Approach Delay, s/veh		16.3			16.2			15.4			13.4	
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	15.0	9.0	9.4	5.1	14.8	8.9	9.5
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	* 5	* 5
Max Green Setting (Gmax), s	20.8	40.0	20.0	* 30	20.0	40.0	* 19	* 30
Max Q Clear Time (g_c+I1), s	2.3	8.8	4.3	3.8	2.4	5.2	2.7	3.8
Green Ext Time (p_c), s	0.0	0.4	0.0	0.1	0.0	0.4	0.1	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	110	94	34	145	0	0	0	0	0	4	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	81	81	81	70	70	70	79	79	79
Heavy Vehicles, %	2	2	3	6	6	2	2	2	2	2	75	3
Mvmt Flow	0	124	106	42	179	0	0	0	0	0	5	51

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	179	0	0	229	0	0	441	439	176	439	492	179
Stage 1	-	-	-	-	-	-	176	176	-	263	263	-
Stage 2	-	-	-	-	-	-	265	263	-	176	229	-
Critical Hdwy	4.12	-	-	4.16	-	-	7.12	6.52	6.22	7.12	7.25	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	6.25	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	6.25	-
Follow-up Hdwy	2.218	-	-	2.254	-	-	3.518	4.018	3.318	3.518	4.675	3.327
Pot Cap-1 Maneuver	1397	-	-	1316	-	-	527	512	867	528	387	861
Stage 1	-	-	-	-	-	-	826	753	-	742	576	-
Stage 2	-	-	-	-	-	-	740	691	-	826	598	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1397	-	-	1316	-	-	478	494	867	514	373	861
Mov Cap-2 Maneuver	-	-	-	-	-	-	478	494	-	514	373	-
Stage 1	-	-	-	-	-	-	826	753	-	742	556	-
Stage 2	-	-	-	-	-	-	666	667	-	826	598	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.5	0	9.9
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1397	-	-	1316	-	-	373	861
HCM Lane V/C Ratio	-	-	-	-	0.032	-	-	0.014	0.059
HCM Control Delay (s)	0	0	-	-	7.8	0	-	14.8	9.4
HCM Lane LOS	A	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0	0.2

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	67	43	0	78	2	101	0	46	0	0	0
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	82	82	82	79	79	79	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	78	50	0	95	2	128	0	58	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	95	0	-	78	0	0	173	173	78
Stage 1	-	-	-	-	-	-	78	78	-
Stage 2	-	-	-	-	-	-	95	95	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1499	-	0	1520	-	0	817	720	983
Stage 1	-	-	0	-	-	0	945	830	-
Stage 2	-	-	0	-	-	0	929	816	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1499	-	-	1520	-	-	817	0	983
Mov Cap-2 Maneuver	-	-	-	-	-	-	817	0	-
Stage 1	-	-	-	-	-	-	945	0	-
Stage 2	-	-	-	-	-	-	929	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	863	1499	-	1520	-
HCM Lane V/C Ratio	0.216	-	-	-	-
HCM Control Delay (s)	10.3	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	0.8	0	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	216	116	4	236	80	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	87	87	87	90	90	90
Heavy Vehicles, %	2	5	2	2	9	34	2	2	2
Mvmt Flow	0	254	136	5	271	92	0	0	0

Major/Minor	Major1			Major2		
Conflicting Flow All	271	0	0	391	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	1292	-	-	1168	-	0
Stage 1	-	-	-	-	-	0
Stage 2	-	-	-	-	-	0
Platoon blocked, %		-	-		-	
Mov Cap-1 Maneuver	1292	-	-	1168	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB
HCM Control Delay, s	0	0.1
HCM LOS		

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	1292	-	-	1168	-	355	747
HCM Lane V/C Ratio	-	-	-	0.004	-	0.04	0.017
HCM Control Delay (s)	0	-	-	8.1	0	15.6	9.9
HCM Lane LOS	A	-	-	A	A	C	A
HCM 95th %tile Q(veh)	0	-	-	0	-	0.1	0.1

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	10	0	9
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	30
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	70	70	70
Heavy Vehicles, %	80	2	11
Mvmt Flow	14	0	13

Major/Minor	Minor2		
Conflicting Flow All	602	671	271
Stage 1	280	280	-
Stage 2	322	391	-
Critical Hdwy	7.2	6.52	6.31
Critical Hdwy Stg 1	6.2	5.52	-
Critical Hdwy Stg 2	6.2	5.52	-
Follow-up Hdwy	4.22	4.018	3.399
Pot Cap-1 Maneuver	357	378	747
Stage 1	618	679	-
Stage 2	588	607	-
Platoon blocked, %			
Mov Cap-1 Maneuver	355	0	747
Mov Cap-2 Maneuver	355	0	-
Stage 1	615	0	-
Stage 2	588	0	-

Approach	SB
HCM Control Delay, s	12.9
HCM LOS	B

Minor Lane/Major Mvmt

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	216	10	0	251	15	69	1	49	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1763	1900	0	1610	1242	1900	1776	1293			
Adj Flow Rate, veh/h	0	245	0	0	326	19	95	1	67			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.88	0.88	0.88	0.77	0.77	0.77	0.73	0.73	0.73			
Percent Heavy Veh, %	0	8	8	0	18	53	47	100	47			
Cap, veh/h	0	698	0	0	637	418	364	4	239			
Arrive On Green	0.00	0.40	0.00	0.00	0.40	0.40	0.22	0.22	0.22			
Sat Flow, veh/h	0	1763	0	0	1610	1056	1675	18	1099			
Grp Volume(v), veh/h	0	245	0	0	326	19	96	0	67			
Grp Sat Flow(s),veh/h/ln	0	1763	0	0	1610	1056	1692	0	1099			
Q Serve(g_s), s	0.0	2.4	0.0	0.0	3.8	0.3	1.2	0.0	1.3			
Cycle Q Clear(g_c), s	0.0	2.4	0.0	0.0	3.8	0.3	1.2	0.0	1.3			
Prop In Lane	0.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	0	698	0	0	637	418	368	0	239			
V/C Ratio(X)	0.00	0.35	0.00	0.00	0.51	0.05	0.26	0.00	0.28			
Avail Cap(c_a), veh/h	0	2841	0	0	2594	1700	1022	0	664			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	5.3	0.0	0.0	5.7	4.6	8.1	0.0	8.1			
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.0	0.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	1.2	0.0	0.0	1.7	0.1	0.5	0.0	0.4			
LnGrp Delay(d),s/veh	0.0	5.4	0.0	0.0	5.9	4.6	8.2	0.0	8.3			
LnGrp LOS		A			A	A	A		A			
Approach Vol, veh/h		245			345			163				
Approach Delay, s/veh		5.4			5.8			8.3				
Approach LOS		A			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		15.3				15.3		9.5
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		4.4				5.8		3.3
Green Ext Time (p_c), s		0.9				0.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	6.2
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	11	414	11	3	236	2	4	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	76	76	76	70	70	70
Heavy Vehicles, %	18	9	2	2	18	2	25	33	2
Mvmt Flow	14	518	14	4	311	3	6	9	9

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	313	0	0	531	0	0	876	873	524
Stage 1	-	-	-	-	-	-	552	552	-
Stage 2	-	-	-	-	-	-	324	321	-
Critical Hdwy	4.28	-	-	4.12	-	-	7.35	6.83	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.35	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.35	5.83	-
Follow-up Hdwy	2.362	-	-	2.218	-	-	3.725	4.297	3.318
Pot Cap-1 Maneuver	1162	-	-	1036	-	-	246	257	553
Stage 1	-	-	-	-	-	-	479	468	-
Stage 2	-	-	-	-	-	-	642	600	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1162	-	-	1036	-	-	238	251	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	238	251	-
Stage 1	-	-	-	-	-	-	471	460	-
Stage 2	-	-	-	-	-	-	631	597	-

Approach	EB	WB	NB
HCM Control Delay, s	0.2	0.1	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	310	1162	-	-	1036	-	-	319
HCM Lane V/C Ratio	0.074	0.012	-	-	0.004	-	-	0.045
HCM Control Delay (s)	17.5	8.1	0	-	8.5	0	-	16.8
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	4	2	4
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	70	70	70
Heavy Vehicles, %	25	50	2
Mvmt Flow	6	3	6

Major/Minor	Minor2		
Conflicting Flow All	880	879	312
Stage 1	320	320	-
Stage 2	560	559	-
Critical Hdwy	7.35	7	6.22
Critical Hdwy Stg 1	6.35	6	-
Critical Hdwy Stg 2	6.35	6	-
Follow-up Hdwy	3.725	4.45	3.318
Pot Cap-1 Maneuver	244	240	728
Stage 1	646	575	-
Stage 2	474	441	-
Platoon blocked, %			
Mov Cap-1 Maneuver	230	235	728
Mov Cap-2 Maneuver	230	235	-
Stage 1	635	572	-
Stage 2	450	434	-

Approach	SB
HCM Control Delay, s	16.8
HCM LOS	C

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	84	376	5	8	209	1	2	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	89	89	89	70	70	70
Heavy Vehicles, %	35	2	40	13	5	100	100	25	20
Mvmt Flow	97	432	6	9	235	1	3	6	7

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	236	0	0	438	0	0	930	882	435
Stage 1	-	-	-	-	-	-	628	628	-
Stage 2	-	-	-	-	-	-	302	254	-
Critical Hdwy	4.45	-	-	4.23	-	-	8.1	6.75	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	5.75	-
Follow-up Hdwy	2.515	-	-	2.317	-	-	4.4	4.225	3.48
Pot Cap-1 Maneuver	1160	-	-	1066	-	-	169	262	585
Stage 1	-	-	-	-	-	-	340	442	-
Stage 2	-	-	-	-	-	-	539	657	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1160	-	-	1066	-	-	135	238	585
Mov Cap-2 Maneuver	-	-	-	-	-	-	135	238	-
Stage 1	-	-	-	-	-	-	312	405	-
Stage 2	-	-	-	-	-	-	464	651	-

Approach	EB	WB	NB
HCM Control Delay, s	1.5	0.3	18.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	274	1160	-	-	1066	-	-	608
HCM Lane V/C Ratio	0.057	0.083	-	-	0.008	-	-	0.164
HCM Control Delay (s)	18.9	8.4	-	-	8.4	-	-	12.1
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.3	-	-	0	-	-	0.6

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	3	6	79
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	88	88	88
Heavy Vehicles, %	2	2	37
Mvmt Flow	3	7	90

Major/Minor	Minor2		
Conflicting Flow All	888	884	235
Stage 1	253	253	-
Stage 2	635	631	-
Critical Hdwy	7.12	6.52	6.57
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.633
Pot Cap-1 Maneuver	264	284	725
Stage 1	751	698	-
Stage 2	467	474	-
Platoon blocked, %			
Mov Cap-1 Maneuver	238	258	725
Mov Cap-2 Maneuver	238	258	-
Stage 1	688	692	-
Stage 2	417	434	-

Approach	SB
HCM Control Delay, s	12.1
HCM LOS	B

Minor Lane/Major Mvmt

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	0	79	29	0	59	76	0	0	29	1	60
Peak Hour Factor	0.92	0.70	0.70	0.70	0.92	0.87	0.87	0.87	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	92	97	2	2	95	2	2	97	2	5
Mvmt Flow	0	0	113	41	0	68	87	0	0	32	1	66
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	10.7	8.7	10.3
HCM LOS	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	32%	0%	44%	100%
Vol Thru, %	1%	73%	56%	0%
Vol Right, %	67%	27%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	108	135	1
LT Vol	1	79	76	0
Through Vol	60	29	0	0
RT Vol	29	0	59	1
Lane Flow Rate	99	154	155	1
Geometry Grp	1	1	1	1
Degree of Util (X)	0.166	0.248	0.196	0.002
Departure Headway (Hd)	6.029	5.791	4.552	5.108
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	595	622	788	699
Service Time	4.062	3.816	2.576	3.151
HCM Lane V/C Ratio	0.166	0.248	0.197	0.001
HCM Control Delay	10.3	10.7	8.7	8.2
HCM Lane LOS	B	B	A	A
HCM 95th-tile Q	0.6	1	0.7	0

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	1	0	0
Peak Hour Factor	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	0	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.2
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	129	7	23	136	1	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	80	80	70	70
Heavy Vehicles, %	56	29	2	54	2	11
Mvmt Flow	184	10	29	170	1	39

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	194	0	417	189
Stage 1	-	-	-	-	189	-
Stage 2	-	-	-	-	228	-
Critical Hdwy	-	-	4.12	-	6.42	6.31
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.399
Pot Cap-1 Maneuver	-	-	1379	-	592	830
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	810	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1379	-	578	830
Mov Cap-2 Maneuver	-	-	-	-	578	-
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	791	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	817	-	-	1379	-
HCM Lane V/C Ratio	0.049	-	-	0.021	-
HCM Control Delay (s)	9.6	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	91	63	13	89	59	12	7	122	107	15	161	96
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	1067	1767	1900	1827	1829	1900	1863	1775	1900	1863	1471	1900
Adj Flow Rate, veh/h	111	77	16	116	77	16	9	149	130	20	218	130
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.82	0.82	0.82	0.77	0.77	0.77	0.82	0.82	0.82	0.74	0.74	0.74
Percent Heavy Veh, %	78	6	6	4	3	3	2	8	8	2	3	3
Cap, veh/h	123	157	33	215	166	35	25	244	213	53	255	152
Arrive On Green	0.12	0.11	0.11	0.12	0.11	0.11	0.01	0.28	0.28	0.03	0.29	0.29
Sat Flow, veh/h	1017	1420	295	1740	1470	305	1774	876	764	1774	865	516
Grp Volume(v), veh/h	111	0	93	116	0	93	9	0	279	20	0	348
Grp Sat Flow(s),veh/h/ln	1017	0	1715	1740	0	1775	1774	0	1640	1774	0	1380
Q Serve(g_s), s	4.5	0.0	2.1	2.6	0.0	2.1	0.2	0.0	6.2	0.5	0.0	10.0
Cycle Q Clear(g_c), s	4.5	0.0	2.1	2.6	0.0	2.1	0.2	0.0	6.2	0.5	0.0	10.0
Prop In Lane	1.00		0.17	1.00		0.17	1.00		0.47	1.00		0.37
Lane Grp Cap(c), veh/h	123	0	189	215	0	201	25	0	457	53	0	406
V/C Ratio(X)	0.90	0.00	0.49	0.54	0.00	0.46	0.36	0.00	0.61	0.38	0.00	0.86
Avail Cap(c_a), veh/h	484	0	1225	829	0	1269	845	0	1562	845	0	1315
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	18.2	0.0	17.6	17.3	0.0	17.4	20.5	0.0	13.2	20.0	0.0	14.0
Incr Delay (d2), s/veh	9.0	0.0	0.7	0.8	0.0	0.6	3.1	0.0	0.5	1.7	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	1.6	0.0	1.0	1.3	0.0	1.0	0.1	0.0	2.9	0.3	0.0	4.0
LnGrp Delay(d),s/veh	27.2	0.0	18.3	18.1	0.0	18.0	23.6	0.0	13.6	21.6	0.0	16.0
LnGrp LOS	C		B	B		B	C		B	C		B
Approach Vol, veh/h		204			209			288			368	
Approach Delay, s/veh		23.1			18.1			14.0			16.3	
Approach LOS		C			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	5.3	17.7	9.3	9.6	4.7	18.4	9.2	9.7
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	4.1	* 5
Max Green Setting (Gmax), s	20.0	40.0	20.0	* 30	20.0	40.0	20.0	* 30
Max Q Clear Time (g_c+I1), s	2.5	8.2	4.6	4.1	2.2	12.0	6.5	4.1
Green Ext Time (p_c), s	0.0	0.6	0.0	0.3	0.0	0.6	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	17.3
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	83	153	34	194	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	91	91	91	70	70	70
Heavy Vehicles, %	2	10	49	2	37	2	2	2	2
Mvmt Flow	0	87	161	37	213	0	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	213	0	0	248	0	0	457	456	168
Stage 1	-	-	-	-	-	-	168	168	-
Stage 2	-	-	-	-	-	-	289	288	-
Critical Hdwy	4.12	-	-	4.12	-	-	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	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1357	-	-	1318	-	-	514	501	876
Stage 1	-	-	-	-	-	-	834	759	-
Stage 2	-	-	-	-	-	-	719	674	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1357	-	-	1318	-	-	434	485	876
Mov Cap-2 Maneuver	-	-	-	-	-	-	434	485	-
Stage 1	-	-	-	-	-	-	834	759	-
Stage 2	-	-	-	-	-	-	603	652	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1357	-	-	1318	-	-	437	815
HCM Lane V/C Ratio	-	-	-	-	0.028	-	-	0.003	0.131
HCM Control Delay (s)	0	0	-	-	7.8	0	-	13.3	10.1
HCM Lane LOS	A	A	-	-	A	A	-	B	B
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0	0.5

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	0	1	75
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	25
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	70	70	70
Heavy Vehicles, %	2	2	7
Mvmt Flow	0	1	107

Major/Minor	Minor2		
Conflicting Flow All	456	536	213
Stage 1	288	288	-
Stage 2	168	248	-
Critical Hdwy	7.12	6.52	6.27
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.363
Pot Cap-1 Maneuver	515	451	815
Stage 1	720	674	-
Stage 2	834	701	-
Platoon blocked, %			
Mov Cap-1 Maneuver	502	437	815
Mov Cap-2 Maneuver	502	437	-
Stage 1	720	652	-
Stage 2	834	701	-

Approach	SB
HCM Control Delay, s	10.1
HCM LOS	B

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	51	32	0	80	1	148	1	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	87	87	87	86	86	86
Heavy Vehicles, %	2	4	19	2	3	2	46	2	2
Mvmt Flow	0	63	40	0	92	1	172	1	26

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	92	0	-	63	0	0	155	155	63
Stage 1	-	-	-	-	-	-	63	63	-
Stage 2	-	-	-	-	-	-	92	92	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.86	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.86	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.86	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.914	4.018	3.318
Pot Cap-1 Maneuver	1503	-	0	1540	-	0	744	737	1002
Stage 1	-	-	0	-	-	0	859	842	-
Stage 2	-	-	0	-	-	0	832	819	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1503	-	-	1540	-	-	744	0	1002
Mov Cap-2 Maneuver	-	-	-	-	-	-	744	0	-
Stage 1	-	-	-	-	-	-	859	0	-
Stage 2	-	-	-	-	-	-	832	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	770	1503	-	1540	-
HCM Lane V/C Ratio	0.258	-	-	-	-
HCM Control Delay (s)	11.3	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	1	0	-	0	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	0
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	70	70	70
Heavy Vehicles, %	2	2	2
Mvmt Flow	0	0	0

Major/Minor	
Conflicting Flow All	
Stage 1	
Stage 2	
Critical Hdwy	
Critical Hdwy Stg 1	
Critical Hdwy Stg 2	
Follow-up Hdwy	
Pot Cap-1 Maneuver	
Stage 1	
Stage 2	
Platoon blocked, %	
Mov Cap-1 Maneuver	
Mov Cap-2 Maneuver	
Stage 1	
Stage 2	

Approach	
HCM Control Delay, s	
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	292	210	0	464	51	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	90	90	90	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	332	239	0	516	57	0	0	0

Major/Minor	Major1			Major2		
Conflicting Flow All	516	0	0	570	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	1050	-	-	1002	-	0
Stage 1	-	-	-	-	-	0
Stage 2	-	-	-	-	-	0
Platoon blocked, %		-	-		-	
Mov Cap-1 Maneuver	1050	-	-	1002	-	-
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	SBLn1	SBLn2
Capacity (veh/h)	1050	-	-	1002	-	241	559
HCM Lane V/C Ratio	-	-	-	-	-	0.025	0.011
HCM Control Delay (s)	0	-	-	0	-	20.3	11.5
HCM Lane LOS	A	-	-	A	-	C	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.1	0

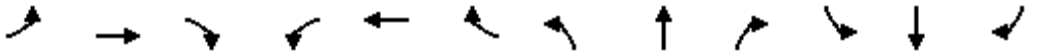
Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	5	0	5
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	30
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	83	83	83
Heavy Vehicles, %	40	2	2
Mvmt Flow	6	0	6

Major/Minor	Minor2		
Conflicting Flow All	967	1086	516
Stage 1	516	516	-
Stage 2	451	570	-
Critical Hdwy	6.8	6.52	6.22
Critical Hdwy Stg 1	5.8	5.52	-
Critical Hdwy Stg 2	5.8	5.52	-
Follow-up Hdwy	3.86	4.018	3.318
Pot Cap-1 Maneuver	241	216	559
Stage 1	529	534	-
Stage 2	569	505	-
Platoon blocked, %			
Mov Cap-1 Maneuver	241	0	559
Mov Cap-2 Maneuver	241	0	-
Stage 1	529	0	-
Stage 2	569	0	-

Approach	SB
HCM Control Delay, s	15.9
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)	0	279	18	0	299	11	216	0	70	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1853	1900	0	1863	1863	1900	1863	1827			
Adj Flow Rate, veh/h	0	307	0	0	315	12	237	0	77			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.91	0.91	0.91	0.95	0.95	0.95	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	2	4	2	4			
Cap, veh/h	0	687	0	0	691	587	479	0	420			
Arrive On Green	0.00	0.37	0.00	0.00	0.37	0.37	0.27	0.00	0.27			
Sat Flow, veh/h	0	1853	0	0	1863	1583	1774	0	1553			
Grp Volume(v), veh/h	0	307	0	0	315	12	237	0	77			
Grp Sat Flow(s),veh/h/ln	0	1853	0	0	1863	1583	1774	0	1553			
Q Serve(g_s), s	0.0	3.3	0.0	0.0	3.4	0.1	3.0	0.0	1.0			
Cycle Q Clear(g_c), s	0.0	3.3	0.0	0.0	3.4	0.1	3.0	0.0	1.0			
Prop In Lane	0.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	687	0	0	691	587	479	0	420			
V/C Ratio(X)	0.00	0.45	0.00	0.00	0.46	0.02	0.49	0.00	0.18			
Avail Cap(c_a), veh/h	0	2772	0	0	2787	2369	995	0	871			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	6.3	0.0	0.0	6.4	5.3	8.2	0.0	7.5			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.2	0.0	0.3	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			
%ile BackOfQ(50%),veh/ln	0.0	1.7	0.0	0.0	1.8	0.1	1.5	0.0	0.4			
LnGrp Delay(d),s/veh	0.0	6.5	0.0	0.0	6.5	5.3	8.5	0.0	7.6			
LnGrp LOS		A			A	A	A		A			
Approach Vol, veh/h		307			327			314				
Approach Delay, s/veh		6.5			6.5			8.3				
Approach LOS		A			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		15.4				15.4		11.3
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		5.3				5.4		5.0
Green Ext Time (p_c), s		0.9				0.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	7.1
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	3	387	11	12	450	0	17	6	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	95	95	95	70	70	70
Heavy Vehicles, %	33	2	18	8	2	2	6	2	2
Mvmt Flow	4	484	14	13	474	0	24	9	13

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	474	0	0	498	0	0	1009	997	491
Stage 1	-	-	-	-	-	-	498	498	-
Stage 2	-	-	-	-	-	-	511	499	-
Critical Hdwy	4.43	-	-	4.18	-	-	7.16	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-
Follow-up Hdwy	2.497	-	-	2.272	-	-	3.554	4.018	3.318
Pot Cap-1 Maneuver	944	-	-	1036	-	-	215	244	578
Stage 1	-	-	-	-	-	-	547	544	-
Stage 2	-	-	-	-	-	-	538	544	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	944	-	-	1036	-	-	201	238	578
Mov Cap-2 Maneuver	-	-	-	-	-	-	201	238	-
Stage 1	-	-	-	-	-	-	544	541	-
Stage 2	-	-	-	-	-	-	507	535	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0.2	22.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	255	944	-	-	1036	-	-	362
HCM Lane V/C Ratio	0.179	0.004	-	-	0.012	-	-	0.077
HCM Control Delay (s)	22.2	8.8	0	-	8.5	0	-	15.8
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	4	4	15
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	82	82	82
Heavy Vehicles, %	2	25	2
Mvmt Flow	5	5	18

Major/Minor	Minor2		
Conflicting Flow All	1008	1004	474
Stage 1	499	499	-
Stage 2	509	505	-
Critical Hdwy	7.12	6.75	6.22
Critical Hdwy Stg 1	6.12	5.75	-
Critical Hdwy Stg 2	6.12	5.75	-
Follow-up Hdwy	3.518	4.225	3.318
Pot Cap-1 Maneuver	219	221	590
Stage 1	554	507	-
Stage 2	547	504	-
Platoon blocked, %			
Mov Cap-1 Maneuver	205	216	590
Mov Cap-2 Maneuver	205	216	-
Stage 1	551	498	-
Stage 2	523	501	-

Approach	SB
HCM Control Delay, s	15.8
HCM LOS	C

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	42	434	2	2	458	5	1	5	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	95	95	95	70	70	70
Heavy Vehicles, %	5	2	2	2	2	2	2	2	2
Mvmt Flow	51	523	2	2	482	5	1	7	10

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	487	0	0	525	0	0	1162	1117	524
Stage 1	-	-	-	-	-	-	625	625	-
Stage 2	-	-	-	-	-	-	537	492	-
Critical Hdwy	4.15	-	-	4.12	-	-	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	2.245	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1061	-	-	1042	-	-	172	207	553
Stage 1	-	-	-	-	-	-	473	477	-
Stage 2	-	-	-	-	-	-	528	548	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1061	-	-	1042	-	-	136	197	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	136	197	-
Stage 1	-	-	-	-	-	-	450	454	-
Stage 2	-	-	-	-	-	-	440	547	-

Approach	EB	WB	NB
HCM Control Delay, s	0.8	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	286	1061	-	-	1042	-	-	497
HCM Lane V/C Ratio	0.065	0.048	-	-	0.002	-	-	0.196
HCM Control Delay (s)	18.5	8.6	-	-	8.5	-	-	14
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.7

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	1	6	76
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	85	85	85
Heavy Vehicles, %	2	2	2
Mvmt Flow	1	7	89

Major/Minor	Minor2		
Conflicting Flow All	1123	1116	485
Stage 1	489	489	-
Stage 2	634	627	-
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	183	208	582
Stage 1	561	549	-
Stage 2	467	476	-
Platoon blocked, %			
Mov Cap-1 Maneuver	168	198	582
Mov Cap-2 Maneuver	168	198	-
Stage 1	534	548	-
Stage 2	430	453	-

Approach	SB
HCM Control Delay, s	14
HCM LOS	B

Minor Lane/Major Mvmt

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	0	6	2	0	72	7	2	0	1	0	46
Peak Hour Factor	0.92	0.70	0.70	0.70	0.92	0.85	0.85	0.85	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	50	50	2	2	43	2	2	100	2	2
Mvmt Flow	0	0	9	3	0	85	8	2	0	1	0	66
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8	7.8	8.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	89%	100%
Vol Thru, %	0%	75%	9%	0%
Vol Right, %	98%	25%	2%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	47	8	81	2
LT Vol	0	6	7	0
Through Vol	46	2	2	0
RT Vol	1	0	72	2
Lane Flow Rate	67	11	95	3
Geometry Grp	1	1	1	1
Degree of Util (X)	0.097	0.015	0.112	0.003
Departure Headway (Hd)	5.207	4.798	4.229	4.373
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	684	735	838	806
Service Time	3.27	2.896	2.306	2.469
HCM Lane V/C Ratio	0.098	0.015	0.113	0.004
HCM Control Delay	8.8	8	7.8	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0	0.4	0

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	2	0	0
Peak Hour Factor	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	3	0	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.5
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	57	0	26	90	4	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	86	86	70	70
Heavy Vehicles, %	5	2	2	3	2	2
Mvmt Flow	76	0	30	105	6	44

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	76	0	241	76
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	165	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1523	-	747	985
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	864	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1523	-	731	985
Mov Cap-2 Maneuver	-	-	-	-	731	-
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	846	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	947	-	-	1523	-
HCM Lane V/C Ratio	0.053	-	-	0.02	-
HCM Control Delay (s)	9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	55	14	103	66	16	14	180	96	12	120	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		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	1727	1863	1900	1863	1863	1900	1863	1850	1900	1759	1801	1900
Adj Flow Rate, veh/h	40	73	19	113	73	18	17	214	114	13	130	43
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.75	0.75	0.75	0.91	0.91	0.91	0.84	0.84	0.84	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	2	2	2	2	2	2	8	4	4
Cap, veh/h	168	163	42	227	168	41	46	268	143	34	298	99
Arrive On Green	0.10	0.11	0.11	0.13	0.12	0.12	0.03	0.24	0.24	0.02	0.23	0.23
Sat Flow, veh/h	1645	1426	371	1774	1443	356	1774	1136	605	1675	1297	429
Grp Volume(v), veh/h	40	0	92	113	0	91	17	0	328	13	0	173
Grp Sat Flow(s),veh/h/ln	1645	0	1797	1774	0	1799	1774	0	1742	1675	0	1725
Q Serve(g_s), s	0.9	0.0	1.8	2.3	0.0	1.8	0.4	0.0	6.8	0.3	0.0	3.3
Cycle Q Clear(g_c), s	0.9	0.0	1.8	2.3	0.0	1.8	0.4	0.0	6.8	0.3	0.0	3.3
Prop In Lane	1.00		0.21	1.00		0.20	1.00		0.35	1.00		0.25
Lane Grp Cap(c), veh/h	168	0	205	227	0	209	46	0	411	34	0	397
V/C Ratio(X)	0.24	0.00	0.45	0.50	0.00	0.43	0.37	0.00	0.80	0.38	0.00	0.44
Avail Cap(c_a), veh/h	821	0	1409	927	0	1410	927	0	1821	876	0	1804
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	15.8	0.0	15.8	15.5	0.0	15.7	18.3	0.0	13.8	18.5	0.0	12.6
Incr Delay (d2), s/veh	0.3	0.0	0.6	0.6	0.0	0.5	1.8	0.0	1.4	2.6	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	0.4	0.0	0.9	1.1	0.0	0.9	0.2	0.0	3.3	0.2	0.0	1.6
LnGrp Delay(d),s/veh	16.1	0.0	16.4	16.2	0.0	16.3	20.2	0.0	15.1	21.1	0.0	12.9
LnGrp LOS	B		B	B		B	C		B	C		B
Approach Vol, veh/h		132			204			345			186	
Approach Delay, s/veh		16.3			16.2			15.4			13.5	
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	15.0	9.0	9.4	5.1	14.8	8.9	9.5
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	* 5	* 5
Max Green Setting (Gmax), s	20.0	40.0	20.0	* 30	20.0	40.0	* 19	* 30
Max Q Clear Time (g_c+I1), s	2.3	8.8	4.3	3.8	2.4	5.3	2.9	3.8
Green Ext Time (p_c), s	0.0	0.4	0.0	0.1	0.0	0.4	0.1	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	110	96	34	147	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	81	81	81	70	70	70
Heavy Vehicles, %	2	2	5	6	7	2	2	2	2
Mvmt Flow	0	124	108	42	181	0	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	181	0	0	231	0	0	446	443	178
Stage 1	-	-	-	-	-	-	178	178	-
Stage 2	-	-	-	-	-	-	268	265	-
Critical Hdwy	4.12	-	-	4.16	-	-	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	2.218	-	-	2.254	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1394	-	-	1314	-	-	523	509	865
Stage 1	-	-	-	-	-	-	824	752	-
Stage 2	-	-	-	-	-	-	738	689	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1394	-	-	1314	-	-	474	491	865
Mov Cap-2 Maneuver	-	-	-	-	-	-	474	491	-
Stage 1	-	-	-	-	-	-	824	752	-
Stage 2	-	-	-	-	-	-	663	664	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1394	-	-	1314	-	-	371	859
HCM Lane V/C Ratio	-	-	-	-	0.032	-	-	0.014	0.059
HCM Control Delay (s)	0	0	-	-	7.8	0	-	14.8	9.5
HCM Lane LOS	A	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0	0.2

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	0	4	40
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	25
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	79	79	79
Heavy Vehicles, %	2	75	3
Mvmt Flow	0	5	51

Major/Minor	Minor2		
Conflicting Flow All	443	496	181
Stage 1	265	265	-
Stage 2	178	231	-
Critical Hdwy	7.12	7.25	6.23
Critical Hdwy Stg 1	6.12	6.25	-
Critical Hdwy Stg 2	6.12	6.25	-
Follow-up Hdwy	3.518	4.675	3.327
Pot Cap-1 Maneuver	525	385	859
Stage 1	740	575	-
Stage 2	824	597	-
Platoon blocked, %			
Mov Cap-1 Maneuver	511	371	859
Mov Cap-2 Maneuver	511	371	-
Stage 1	740	554	-
Stage 2	824	597	-

Approach	SB
HCM Control Delay, s	10
HCM LOS	B

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	67	43	0	78	2	103	0	46
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	82	82	82	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2	3	2	2
Mvmt Flow	0	78	50	0	95	2	130	0	58

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	95	0	-	78	0	0	173	173	78
Stage 1	-	-	-	-	-	-	78	78	-
Stage 2	-	-	-	-	-	-	95	95	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.43	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.527	4.018	3.318
Pot Cap-1 Maneuver	1499	-	0	1520	-	0	815	720	983
Stage 1	-	-	0	-	-	0	943	830	-
Stage 2	-	-	0	-	-	0	926	816	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1499	-	-	1520	-	-	815	0	983
Mov Cap-2 Maneuver	-	-	-	-	-	-	815	0	-
Stage 1	-	-	-	-	-	-	943	0	-
Stage 2	-	-	-	-	-	-	926	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	860	1499	-	1520	-
HCM Lane V/C Ratio	0.219	-	-	-	-
HCM Control Delay (s)	10.4	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	0.8	0	-	0	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	0
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	70	70	70
Heavy Vehicles, %	2	2	2
Mvmt Flow	0	0	0

Major/Minor	
Conflicting Flow All	
Stage 1	
Stage 2	
Critical Hdwy	
Critical Hdwy Stg 1	
Critical Hdwy Stg 2	
Follow-up Hdwy	
Pot Cap-1 Maneuver	
Stage 1	
Stage 2	
Platoon blocked, %	
Mov Cap-1 Maneuver	
Mov Cap-2 Maneuver	
Stage 1	
Stage 2	

Approach	
HCM Control Delay, s	
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	352	240	0	422	251	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	90	90	90
Heavy Vehicles, %	2	3	2	2	8	17	2	2	2
Mvmt Flow	0	400	273	0	480	285	0	0	0

Major/Minor	Major1			Major2		
Conflicting Flow All	480	0	0	673	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	1082	-	-	918	-	0
Stage 1	-	-	-	-	-	0
Stage 2	-	-	-	-	-	0
Platoon blocked, %		-	-		-	
Mov Cap-1 Maneuver	1082	-	-	918	-	-
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	SBLn1	SBLn2
Capacity (veh/h)	1082	-	-	918	-	195	570
HCM Lane V/C Ratio	-	-	-	-	-	0.093	0.02
HCM Control Delay (s)	0	-	-	0	-	25.4	11.4
HCM Lane LOS	A	-	-	A	-	D	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.3	0.1

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	16	0	10
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	30
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	88	88	88
Heavy Vehicles, %	75	2	10
Mvmt Flow	18	0	11

Major/Minor	Minor2		
Conflicting Flow All	1016	1153	480
Stage 1	480	480	-
Stage 2	536	673	-
Critical Hdwy	7.15	6.52	6.3
Critical Hdwy Stg 1	6.15	5.52	-
Critical Hdwy Stg 2	6.15	5.52	-
Follow-up Hdwy	4.175	4.018	3.39
Pot Cap-1 Maneuver	195	197	570
Stage 1	495	554	-
Stage 2	463	454	-
Platoon blocked, %			
Mov Cap-1 Maneuver	195	0	570
Mov Cap-2 Maneuver	195	0	-
Stage 1	495	0	-
Stage 2	463	0	-

Approach	SB
HCM Control Delay, s	20
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)	0	348	20	0	473	26	200	1	171	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1780	1900	0	1696	1301	1900	1786	1597			
Adj Flow Rate, veh/h	0	395	0	0	538	30	227	1	194			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88			
Percent Heavy Veh, %	0	7	7	0	12	46	19	100	19			
Cap, veh/h	0	712	0	0	679	442	453	2	363			
Arrive On Green	0.00	0.40	0.00	0.00	0.40	0.40	0.27	0.27	0.27			
Sat Flow, veh/h	0	1780	0	0	1696	1106	1693	7	1357			
Grp Volume(v), veh/h	0	395	0	0	538	30	228	0	194			
Grp Sat Flow(s),veh/h/ln	0	1780	0	0	1696	1106	1701	0	1357			
Q Serve(g_s), s	0.0	4.9	0.0	0.0	8.0	0.5	3.3	0.0	3.5			
Cycle Q Clear(g_c), s	0.0	4.9	0.0	0.0	8.0	0.5	3.3	0.0	3.5			
Prop In Lane	0.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	712	0	0	679	442	455	0	363			
V/C Ratio(X)	0.00	0.55	0.00	0.00	0.79	0.07	0.50	0.00	0.53			
Avail Cap(c_a), veh/h	0	2466	0	0	2350	1532	883	0	705			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	6.7	0.0	0.0	7.6	5.3	8.9	0.0	9.0			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.8	0.0	0.3	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			
%ile BackOfQ(50%),veh/ln	0.0	2.5	0.0	0.0	3.9	0.1	1.6	0.0	1.3			
LnGrp Delay(d),s/veh	0.0	6.9	0.0	0.0	8.4	5.4	9.3	0.0	9.5			
LnGrp LOS		A			A	A	A		A			
Approach Vol, veh/h		395			568			422				
Approach Delay, s/veh		6.9			8.3			9.4				
Approach LOS		A			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		17.1				17.1		11.8
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		6.9				10.0		5.5
Green Ext Time (p_c), s		1.5				1.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	20	539	100	5	329	5	100	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	20	6	2	2	12	2	3	30	2
Mvmt Flow	23	612	114	6	374	6	114	11	11

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	380	0	0	726	0	0	1112	1106	669
Stage 1	-	-	-	-	-	-	715	715	-
Stage 2	-	-	-	-	-	-	397	391	-
Critical Hdwy	4.3	-	-	4.12	-	-	7.13	6.8	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.8	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.8	-
Follow-up Hdwy	2.38	-	-	2.218	-	-	3.527	4.27	3.318
Pot Cap-1 Maneuver	1086	-	-	877	-	-	185	187	458
Stage 1	-	-	-	-	-	-	420	395	-
Stage 2	-	-	-	-	-	-	627	561	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1086	-	-	877	-	-	170	179	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	170	179	-
Stage 1	-	-	-	-	-	-	405	381	-
Stage 2	-	-	-	-	-	-	604	556	-

Approach	EB	WB	NB
HCM Control Delay, s	0.3	0.1	69.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	180	1086	-	-	877	-	-	244
HCM Lane V/C Ratio	0.758	0.021	-	-	0.006	-	-	0.093
HCM Control Delay (s)	69.4	8.4	0	-	9.1	0	-	21.3
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	4.9	0.1	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	5	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	88	88	88
Heavy Vehicles, %	20	60	2
Mvmt Flow	6	6	11

Major/Minor	Minor2		
Conflicting Flow All	1114	1160	377
Stage 1	388	388	-
Stage 2	726	772	-
Critical Hdwy	7.3	7.1	6.22
Critical Hdwy Stg 1	6.3	6.1	-
Critical Hdwy Stg 2	6.3	6.1	-
Follow-up Hdwy	3.68	4.54	3.318
Pot Cap-1 Maneuver	171	153	670
Stage 1	601	520	-
Stage 2	389	335	-
Platoon blocked, %			
Mov Cap-1 Maneuver	153	146	670
Mov Cap-2 Maneuver	153	146	-
Stage 1	579	515	-
Stage 2	355	323	-

Approach	SB
HCM Control Delay, s	21.3
HCM LOS	C

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	126	453	5	10	283	5	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	89	89	89	88	88	88
Heavy Vehicles, %	14	2	40	10	6	100	100	20	20
Mvmt Flow	143	515	6	11	318	6	6	6	6

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	324	0	0	520	0	0	1207	1150	518
Stage 1	-	-	-	-	-	-	804	804	-
Stage 2	-	-	-	-	-	-	403	346	-
Critical Hdwy	4.24	-	-	4.2	-	-	8.1	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	5.7	-
Follow-up Hdwy	2.326	-	-	2.29	-	-	4.4	4.18	3.48
Pot Cap-1 Maneuver	1171	-	-	1007	-	-	104	184	524
Stage 1	-	-	-	-	-	-	263	371	-
Stage 2	-	-	-	-	-	-	468	605	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1171	-	-	1007	-	-	75	160	524
Mov Cap-2 Maneuver	-	-	-	-	-	-	75	160	-
Stage 1	-	-	-	-	-	-	231	326	-
Stage 2	-	-	-	-	-	-	382	598	-

Approach	EB	WB	NB
HCM Control Delay, s	1.8	0.3	34.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	140	1171	-	-	1007	-	-	478
HCM Lane V/C Ratio	0.122	0.122	-	-	0.011	-	-	0.264
HCM Control Delay (s)	34.2	8.5	-	-	8.6	-	-	15.2
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0.4	-	-	0	-	-	1.1

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	5	10	96
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	88	88	88
Heavy Vehicles, %	2	2	19
Mvmt Flow	6	11	109

Major/Minor	Minor2		
Conflicting Flow All	1153	1150	321
Stage 1	343	343	-
Stage 2	810	807	-
Critical Hdwy	7.12	6.52	6.39
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.471
Pot Cap-1 Maneuver	174	198	682
Stage 1	672	637	-
Stage 2	374	394	-
Platoon blocked, %			
Mov Cap-1 Maneuver	151	172	682
Mov Cap-2 Maneuver	151	172	-
Stage 1	590	630	-
Stage 2	319	346	-

Approach	SB
HCM Control Delay, s	15.2
HCM LOS	C

Minor Lane/Major Mvmt

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	5	49	21	0	90	49	5	0	21	5	110
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	88	76	2	2	88	2	2	76	2	5
Mvmt Flow	0	6	56	24	0	102	56	6	0	23	5	121
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8	8.8	9.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	7%	62%	33%
Vol Thru, %	4%	65%	34%	33%
Vol Right, %	81%	28%	3%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	136	75	144	15
LT Vol	5	49	49	5
Through Vol	110	21	5	5
RT Vol	21	5	90	5
Lane Flow Rate	149	85	164	17
Geometry Grp	1	1	1	1
Degree of Util (X)	0.221	0.105	0.209	0.022
Departure Headway (Hd)	5.335	4.426	4.591	4.583
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	674	811	784	780
Service Time	3.364	2.449	2.611	2.619
HCM Lane V/C Ratio	0.221	0.105	0.209	0.022
HCM Control Delay	9.9	8	8.8	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.4	0.8	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	5	5	5
Peak Hour Factor	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	6	6	6
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.7
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	149	10	30	139	5	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	30	30	2	32	2	10
Mvmt Flow	169	11	34	158	6	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	181	0	401	175
Stage 1	-	-	-	-	175	-
Stage 2	-	-	-	-	226	-
Critical Hdwy	-	-	4.12	-	6.42	6.3
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.39
Pot Cap-1 Maneuver	-	-	1394	-	605	848
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	812	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1394	-	589	848
Mov Cap-2 Maneuver	-	-	-	-	589	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	798	-	-	1394	-
HCM Lane V/C Ratio	0.05	-	-	0.024	-
HCM Control Delay (s)	9.7	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	79	90	20	120	100	30	10	133	120	20	173	69
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	1234	1752	1900	1827	1816	1900	1863	1749	1900	1863	1583	1900
Adj Flow Rate, veh/h	90	102	23	136	114	34	11	151	136	23	197	78
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	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, %	54	7	7	4	3	3	2	11	11	2	5	5
Cap, veh/h	130	181	41	237	211	63	31	188	170	60	257	102
Arrive On Green	0.11	0.13	0.13	0.14	0.16	0.16	0.02	0.22	0.22	0.03	0.24	0.24
Sat Flow, veh/h	1175	1384	312	1740	1345	401	1774	849	765	1774	1080	428
Grp Volume(v), veh/h	90	0	125	136	0	148	11	0	287	23	0	275
Grp Sat Flow(s),veh/h/ln	1175	0	1697	1740	0	1746	1774	0	1614	1774	0	1507
Q Serve(g_s), s	3.0	0.0	2.8	2.9	0.0	3.1	0.2	0.0	6.8	0.5	0.0	6.8
Cycle Q Clear(g_c), s	3.0	0.0	2.8	2.9	0.0	3.1	0.2	0.0	6.8	0.5	0.0	6.8
Prop In Lane	1.00		0.18	1.00		0.23	1.00		0.47	1.00		0.28
Lane Grp Cap(c), veh/h	130	0	222	237	0	273	31	0	358	60	0	359
V/C Ratio(X)	0.69	0.00	0.56	0.57	0.00	0.54	0.36	0.00	0.80	0.38	0.00	0.77
Avail Cap(c_a), veh/h	584	0	1266	866	0	1302	882	0	1606	882	0	1500
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	17.2	0.0	16.4	16.3	0.0	15.6	19.5	0.0	14.8	19.0	0.0	14.3
Incr Delay (d2), s/veh	2.5	0.0	0.8	0.8	0.0	0.6	2.6	0.0	1.6	1.5	0.0	1.3
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	1.0	0.0	1.3	1.5	0.0	1.6	0.1	0.0	3.1	0.3	0.0	3.0
LnGrp Delay(d),s/veh	19.7	0.0	17.2	17.1	0.0	16.2	22.2	0.0	16.4	20.5	0.0	15.6
LnGrp LOS	B		B	B		B	C		B	C		B
Approach Vol, veh/h		215			284			298			298	
Approach Delay, s/veh		18.3			16.7			16.6			15.9	
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	5.5	14.9	9.6	10.3	4.8	15.6	8.5	11.3
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	4.1	* 5
Max Green Setting (Gmax), s	20.0	40.0	20.0	* 30	20.0	40.0	20.0	* 30
Max Q Clear Time (g_c+I1), s	2.5	8.8	4.9	4.8	2.2	8.8	5.0	5.1
Green Ext Time (p_c), s	0.0	0.5	0.0	0.4	0.0	0.5	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.8
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	107	150	40	180	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	91	91	91	88	88	88
Heavy Vehicles, %	2	7	35	2	26	2	2	2	2
Mvmt Flow	0	113	158	44	198	0	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	198	0	0	271	0	0	478	478	192
Stage 1	-	-	-	-	-	-	192	192	-
Stage 2	-	-	-	-	-	-	286	286	-
Critical Hdwy	4.12	-	-	4.12	-	-	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	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1375	-	-	1292	-	-	498	486	850
Stage 1	-	-	-	-	-	-	810	742	-
Stage 2	-	-	-	-	-	-	721	675	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1375	-	-	1292	-	-	429	468	850
Mov Cap-2 Maneuver	-	-	-	-	-	-	429	468	-
Stage 1	-	-	-	-	-	-	810	742	-
Stage 2	-	-	-	-	-	-	615	649	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1375	-	-	1292	-	-	472	838
HCM Lane V/C Ratio	-	-	-	-	0.034	-	-	0.014	0.111
HCM Control Delay (s)	0	0	-	-	7.9	0	-	12.7	9.8
HCM Lane LOS	A	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0	0.4

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	5	1	82
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	25
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	88	88	88
Heavy Vehicles, %	2	2	4
Mvmt Flow	6	1	93

Major/Minor	Minor2		
Conflicting Flow All	478	557	198
Stage 1	286	286	-
Stage 2	192	271	-
Critical Hdwy	7.12	6.52	6.24
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.336
Pot Cap-1 Maneuver	498	439	838
Stage 1	721	675	-
Stage 2	810	685	-
Platoon blocked, %			
Mov Cap-1 Maneuver	484	422	838
Mov Cap-2 Maneuver	484	422	-
Stage 1	721	649	-
Stage 2	810	685	-

Approach	SB
HCM Control Delay, s	10
HCM LOS	B

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	60	52	0	90	5	130	1	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	3	12	2	2	2	33	2	2
Mvmt Flow	0	68	59	0	102	6	148	1	34

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	102	0	-	68	0	0	170	170	68
Stage 1	-	-	-	-	-	-	68	68	-
Stage 2	-	-	-	-	-	-	102	102	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.73	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.73	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.73	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.797	4.018	3.318
Pot Cap-1 Maneuver	1490	-	0	1533	-	0	754	723	995
Stage 1	-	-	0	-	-	0	882	838	-
Stage 2	-	-	0	-	-	0	850	811	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1490	-	-	1533	-	-	754	0	995
Mov Cap-2 Maneuver	-	-	-	-	-	-	754	0	-
Stage 1	-	-	-	-	-	-	882	0	-
Stage 2	-	-	-	-	-	-	850	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	790	1490	-	1533	-
HCM Lane V/C Ratio	0.232	-	-	-	-
HCM Control Delay (s)	10.9	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	0.9	0	-	0	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	0
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	88	88	88
Heavy Vehicles, %	2	2	2
Mvmt Flow	0	0	0

Major/Minor	
Conflicting Flow All	
Stage 1	
Stage 2	
Critical Hdwy	
Critical Hdwy Stg 1	
Critical Hdwy Stg 2	
Follow-up Hdwy	
Pot Cap-1 Maneuver	
Stage 1	
Stage 2	
Platoon blocked, %	
Mov Cap-1 Maneuver	
Mov Cap-2 Maneuver	
Stage 1	
Stage 2	

Approach	
HCM Control Delay, s	
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	335	320	0	735	156	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	90	90	90	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	381	364	0	817	173	0	0	0

Major/Minor	Major1			Major2		
Conflicting Flow All	817	0	0	744	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	811	-	-	864	-	0
Stage 1	-	-	-	-	-	0
Stage 2	-	-	-	-	-	0
Platoon blocked, %		-	-		-	
Mov Cap-1 Maneuver	811	-	-	864	-	-
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	SBLn1	SBLn2
Capacity (veh/h)	811	-	-	864	-	132	376
HCM Lane V/C Ratio	-	-	-	-	-	0.043	0.015
HCM Control Delay (s)	0	-	-	0	-	33.5	14.7
HCM Lane LOS	A	-	-	A	-	D	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.1	0

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	5	0	5
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	30
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	88	88	88
Heavy Vehicles, %	40	2	2
Mvmt Flow	6	0	6

Major/Minor	Minor2		
Conflicting Flow All	1380	1561	817
Stage 1	817	817	-
Stage 2	563	744	-
Critical Hdwy	6.8	6.52	6.22
Critical Hdwy Stg 1	5.8	5.52	-
Critical Hdwy Stg 2	5.8	5.52	-
Follow-up Hdwy	3.86	4.018	3.318
Pot Cap-1 Maneuver	132	112	376
Stage 1	375	390	-
Stage 2	502	421	-
Platoon blocked, %			
Mov Cap-1 Maneuver	132	0	376
Mov Cap-2 Maneuver	132	0	-
Stage 1	375	0	-
Stage 2	502	0	-

Approach	SB
HCM Control Delay, s	24.1
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)	0	320	20	0	541	20	350	0	241	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1854	1900	0	1863	1863	1900	1863	1845			
Adj Flow Rate, veh/h	0	352	0	0	569	21	385	0	265			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.91	0.91	0.91	0.95	0.95	0.95	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	2	3	2	3			
Cap, veh/h	0	721	0	0	724	615	492	0	434			
Arrive On Green	0.00	0.39	0.00	0.00	0.39	0.39	0.28	0.00	0.28			
Sat Flow, veh/h	0	1854	0	0	1863	1583	1774	0	1568			
Grp Volume(v), veh/h	0	352	0	0	569	21	385	0	265			
Grp Sat Flow(s),veh/h/ln	0	1854	0	0	1863	1583	1774	0	1568			
Q Serve(g_s), s	0.0	4.1	0.0	0.0	7.7	0.2	5.8	0.0	4.2			
Cycle Q Clear(g_c), s	0.0	4.1	0.0	0.0	7.7	0.2	5.8	0.0	4.2			
Prop In Lane	0.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	721	0	0	724	615	492	0	434			
V/C Ratio(X)	0.00	0.49	0.00	0.00	0.79	0.03	0.78	0.00	0.61			
Avail Cap(c_a), veh/h	0	2583	0	0	2595	2206	927	0	819			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	6.6	0.0	0.0	7.7	5.4	9.6	0.0	9.0			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.7	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			
%ile BackOfQ(50%),veh/ln	0.0	2.1	0.0	0.0	3.9	0.1	2.9	0.0	1.8			
LnGrp Delay(d),s/veh	0.0	6.8	0.0	0.0	8.5	5.4	10.6	0.0	9.5			
LnGrp LOS		A			A	A	B		A			
Approach Vol, veh/h		352			590			650				
Approach Delay, s/veh		6.8			8.3			10.2				
Approach LOS		A			A			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		16.7				16.7		12.1
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		6.1				9.7		7.8
Green Ext Time (p_c), s		1.4				1.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.8
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	33

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	10	501	110	20	531	5	140	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	88	88	88
Heavy Vehicles, %	30	2	4	10	2	2	6	2	2
Mvmt Flow	11	569	125	21	559	5	159	11	11

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	564	0	0	694	0	0	1273	1261	632
Stage 1	-	-	-	-	-	-	655	655	-
Stage 2	-	-	-	-	-	-	618	606	-
Critical Hdwy	4.4	-	-	4.2	-	-	7.16	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-
Follow-up Hdwy	2.47	-	-	2.29	-	-	3.554	4.018	3.318
Pot Cap-1 Maneuver	882	-	-	865	-	-	~ 141	170	480
Stage 1	-	-	-	-	-	-	448	463	-
Stage 2	-	-	-	-	-	-	470	487	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	882	-	-	865	-	-	~ 125	161	480
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 125	161	-
Stage 1	-	-	-	-	-	-	439	453	-
Stage 2	-	-	-	-	-	-	428	470	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0.3	267.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	133	882	-	-	865	-	-	264
HCM Lane V/C Ratio	1.367	0.013	-	-	0.024	-	-	0.129
HCM Control Delay (s)	267.9	9.1	0	-	9.3	0	-	20.6
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	11.9	0	-	-	0.1	-	-	0.4

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	5	5	20
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	88	88	88
Heavy Vehicles, %	2	20	2
Mvmt Flow	6	6	23

Major/Minor	Minor2		
Conflicting Flow All	1270	1321	562
Stage 1	604	604	-
Stage 2	666	717	-
Critical Hdwy	7.12	6.7	6.22
Critical Hdwy Stg 1	6.12	5.7	-
Critical Hdwy Stg 2	6.12	5.7	-
Follow-up Hdwy	3.518	4.18	3.318
Pot Cap-1 Maneuver	145	144	526
Stage 1	485	460	-
Stage 2	449	408	-
Platoon blocked, %			
Mov Cap-1 Maneuver	128	136	526
Mov Cap-2 Maneuver	128	136	-
Stage 1	475	444	-
Stage 2	418	399	-

Approach	SB
HCM Control Delay, s	20.6
HCM LOS	C

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	51	540	5	5	540	5	5	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	614	6	5	568	5	6	6	11

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	574	0	0	619	0	0	1365	1316	616
Stage 1	-	-	-	-	-	-	732	732	-
Stage 2	-	-	-	-	-	-	633	584	-
Critical Hdwy	4.12	-	-	4.12	-	-	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	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	999	-	-	961	-	-	125	158	491
Stage 1	-	-	-	-	-	-	413	427	-
Stage 2	-	-	-	-	-	-	468	498	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	999	-	-	961	-	-	92	148	491
Mov Cap-2 Maneuver	-	-	-	-	-	-	92	148	-
Stage 1	-	-	-	-	-	-	389	402	-
Stage 2	-	-	-	-	-	-	374	495	-

Approach	EB	WB	NB
HCM Control Delay, s	0.8	0.1	27.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	184	999	-	-	961	-	-	362
HCM Lane V/C Ratio	0.124	0.058	-	-	0.005	-	-	0.301
HCM Control Delay (s)	27.3	8.8	-	-	8.8	-	-	19.2
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0	-	-	1.2

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	5	10	81
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	88	88	88
Heavy Vehicles, %	2	2	2
Mvmt Flow	6	11	92

Major/Minor	Minor2		
Conflicting Flow All	1323	1317	571
Stage 1	582	582	-
Stage 2	741	735	-
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	133	157	520
Stage 1	499	499	-
Stage 2	408	425	-
Platoon blocked, %			
Mov Cap-1 Maneuver	120	147	520
Mov Cap-2 Maneuver	120	147	-
Stage 1	470	496	-
Stage 2	370	400	-

Approach	SB
HCM Control Delay, s	19.2
HCM LOS	C

Minor Lane/Major Mvmt

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	5	6	6	0	80	6	5	0	6	5	50
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	7	7	0	91	7	6	0	7	6	57
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.2	7.9	7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	29%	88%	33%
Vol Thru, %	8%	35%	7%	33%
Vol Right, %	82%	35%	5%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	61	17	91	15
LT Vol	5	6	6	5
Through Vol	50	6	5	5
RT Vol	6	5	80	5
Lane Flow Rate	69	19	103	17
Geometry Grp	1	1	1	1
Degree of Util (X)	0.071	0.022	0.122	0.019
Departure Headway (Hd)	3.687	4.011	4.242	4.068
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	959	886	844	869
Service Time	1.758	2.063	2.272	2.144
HCM Lane V/C Ratio	0.072	0.021	0.122	0.02
HCM Control Delay	7	7.2	7.9	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.4	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	5	5	5
Peak Hour Factor	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	6	6	6
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.2
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	61	5	30	101	5	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	6	34	115	6	45

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	75	0	255	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	183	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1524	-	734	990
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1524	-	716	990
Mov Cap-2 Maneuver	-	-	-	-	716	-
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	828	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	950	-	-	1524	-
HCM Lane V/C Ratio	0.054	-	-	0.022	-
HCM Control Delay (s)	9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	31	70	20	120	80	40	20	190	110	20	130	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1843	1900	1727	1831	1900
Adj Flow Rate, veh/h	35	80	23	132	88	44	23	216	125	22	141	45
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.88	0.88	0.88	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	10	4	4
Cap, veh/h	166	165	47	237	160	80	60	267	154	53	322	103
Arrive On Green	0.09	0.12	0.12	0.13	0.14	0.14	0.03	0.24	0.24	0.03	0.24	0.24
Sat Flow, veh/h	1774	1392	400	1774	1172	586	1774	1095	634	1645	1331	425
Grp Volume(v), veh/h	35	0	103	132	0	132	23	0	341	22	0	186
Grp Sat Flow(s),veh/h/ln	1774	0	1792	1774	0	1757	1774	0	1729	1645	0	1756
Q Serve(g_s), s	0.7	0.0	2.2	2.8	0.0	2.9	0.5	0.0	7.6	0.5	0.0	3.6
Cycle Q Clear(g_c), s	0.7	0.0	2.2	2.8	0.0	2.9	0.5	0.0	7.6	0.5	0.0	3.6
Prop In Lane	1.00		0.22	1.00		0.33	1.00		0.37	1.00		0.24
Lane Grp Cap(c), veh/h	166	0	212	237	0	240	60	0	421	53	0	425
V/C Ratio(X)	0.21	0.00	0.49	0.56	0.00	0.55	0.38	0.00	0.81	0.41	0.00	0.44
Avail Cap(c_a), veh/h	834	0	1323	873	0	1297	873	0	1702	809	0	1728
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	17.0	0.0	16.8	16.5	0.0	16.4	19.2	0.0	14.5	19.3	0.0	13.1
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.8	0.0	0.7	1.5	0.0	1.4	1.9	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	0.4	0.0	1.1	1.4	0.0	1.4	0.3	0.0	3.8	0.3	0.0	1.8
LnGrp Delay(d),s/veh	17.3	0.0	17.4	17.3	0.0	17.1	20.7	0.0	15.9	21.2	0.0	13.3
LnGrp LOS	B		B	B		B	C		B	C		B
Approach Vol, veh/h		138			264			364			208	
Approach Delay, s/veh		17.4			17.2			16.2			14.2	
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	5.4	15.9	9.5	9.8	5.5	15.8	8.8	10.5
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	* 5	* 5
Max Green Setting (Gmax), s	20.0	40.0	20.0	* 30	20.0	40.0	* 19	* 30
Max Q Clear Time (g_c+I1), s	2.5	9.6	4.8	4.2	2.5	5.6	2.7	4.9
Green Ext Time (p_c), s	0.0	0.5	0.0	0.1	0.0	0.5	0.1	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	140	101	40	151	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	5	5	2	2	2	2
Mvmt Flow	0	157	113	45	172	0	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	172	0	0	271	0	0	479	477	214
Stage 1	-	-	-	-	-	-	214	214	-
Stage 2	-	-	-	-	-	-	265	263	-
Critical Hdwy	4.12	-	-	4.15	-	-	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	2.218	-	-	2.245	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1405	-	-	1275	-	-	497	487	826
Stage 1	-	-	-	-	-	-	788	725	-
Stage 2	-	-	-	-	-	-	740	691	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1405	-	-	1275	-	-	440	468	826
Mov Cap-2 Maneuver	-	-	-	-	-	-	440	468	-
Stage 1	-	-	-	-	-	-	788	725	-
Stage 2	-	-	-	-	-	-	650	664	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1405	-	-	1275	-	-	413	869
HCM Lane V/C Ratio	-	-	-	-	0.036	-	-	0.025	0.078
HCM Control Delay (s)	0	0	-	-	7.9	0	-	13.9	9.5
HCM Lane LOS	A	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0.1	0.3

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	5	4	60
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	25
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	88	88	88
Heavy Vehicles, %	2	75	3
Mvmt Flow	6	5	68

Major/Minor	Minor2		
Conflicting Flow All	477	534	172
Stage 1	263	263	-
Stage 2	214	271	-
Critical Hdwy	7.12	7.25	6.23
Critical Hdwy Stg 1	6.12	6.25	-
Critical Hdwy Stg 2	6.12	6.25	-
Follow-up Hdwy	3.518	4.675	3.327
Pot Cap-1 Maneuver	498	364	869
Stage 1	742	576	-
Stage 2	788	571	-
Platoon blocked, %			
Mov Cap-1 Maneuver	483	350	869
Mov Cap-2 Maneuver	483	350	-
Stage 1	742	554	-
Stage 2	788	571	-

Approach	SB
HCM Control Delay, s	10.1
HCM LOS	B

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	70	75	0	80	5	111	0	50
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	80	85	0	91	6	126	0	57

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	91	0	-	80	0	0	171	171	80
Stage 1	-	-	-	-	-	-	80	80	-
Stage 2	-	-	-	-	-	-	91	91	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1504	-	0	1518	-	0	819	722	980
Stage 1	-	-	0	-	-	0	943	828	-
Stage 2	-	-	0	-	-	0	933	820	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1504	-	-	1518	-	-	819	0	980
Mov Cap-2 Maneuver	-	-	-	-	-	-	819	0	-
Stage 1	-	-	-	-	-	-	943	0	-
Stage 2	-	-	-	-	-	-	933	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	863	1504	-	1518	-
HCM Lane V/C Ratio	0.212	-	-	-	-
HCM Control Delay (s)	10.3	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	0.8	0	-	0	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	0
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	88	88	88
Heavy Vehicles, %	2	2	2
Mvmt Flow	0	0	0

Major/Minor	
Conflicting Flow All	
Stage 1	
Stage 2	
Critical Hdwy	
Critical Hdwy Stg 1	
Critical Hdwy Stg 2	
Follow-up Hdwy	
Pot Cap-1 Maneuver	
Stage 1	
Stage 2	
Platoon blocked, %	
Mov Cap-1 Maneuver	
Mov Cap-2 Maneuver	
Stage 1	
Stage 2	

Approach	
HCM Control Delay, s	
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	354	240	0	424	260	0	0	0	15	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	90	90	90	88	88	88
Heavy Vehicles, %	2	4	2	2	8	20	2	2	2	73	2	10
Mvmt Flow	0	402	273	0	482	295	0	0	0	17	0	11

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	482	0	0	675	0	0	1021	1157	482
Stage 1	-	-	-	-	-	-	482	482	-
Stage 2	-	-	-	-	-	-	539	675	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.13	6.52	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	4.157	4.018	3.39
Pot Cap-1 Maneuver	1081	-	-	916	-	0	195	196	568
Stage 1	-	-	-	-	-	0	497	553	-
Stage 2	-	-	-	-	-	0	465	453	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	1081	-	-	916	-	-	195	0	568
Mov Cap-2 Maneuver	-	-	-	-	-	-	195	0	-
Stage 1	-	-	-	-	-	-	497	0	-
Stage 2	-	-	-	-	-	-	465	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	19.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	1081	-	-	916	-	195	568
HCM Lane V/C Ratio	-	-	-	-	-	0.087	0.02
HCM Control Delay (s)	0	-	-	0	-	25.2	11.5
HCM Lane LOS	A	-	-	A	-	D	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.3	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	349	20	0	484	25	200	1	180	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1780	1900	0	1667	1319	1900	1786	1545			
Adj Flow Rate, veh/h	0	397	0	0	550	28	227	1	205			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88			
Percent Heavy Veh, %	0	7	7	0	14	44	23	100	23			
Cap, veh/h	0	731	0	0	684	460	447	2	346			
Arrive On Green	0.00	0.41	0.00	0.00	0.41	0.41	0.26	0.26	0.26			
Sat Flow, veh/h	0	1780	0	0	1667	1122	1693	7	1313			
Grp Volume(v), veh/h	0	397	0	0	550	28	228	0	205			
Grp Sat Flow(s),veh/h/ln	0	1780	0	0	1667	1122	1701	0	1313			
Q Serve(g_s), s	0.0	5.0	0.0	0.0	8.6	0.4	3.4	0.0	4.0			
Cycle Q Clear(g_c), s	0.0	5.0	0.0	0.0	8.6	0.4	3.4	0.0	4.0			
Prop In Lane	0.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	731	0	0	684	460	449	0	346			
V/C Ratio(X)	0.00	0.54	0.00	0.00	0.80	0.06	0.51	0.00	0.59			
Avail Cap(c_a), veh/h	0	2417	0	0	2263	1523	866	0	669			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	6.6	0.0	0.0	7.6	5.3	9.2	0.0	9.5			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.9	0.0	0.3	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	0.0			
%ile BackOfQ(50%),veh/ln	0.0	2.5	0.0	0.0	4.0	0.1	1.6	0.0	1.5			
LnGrp Delay(d),s/veh	0.0	6.8	0.0	0.0	8.5	5.3	9.6	0.0	10.1			
LnGrp LOS		A			A	A	A		B			
Approach Vol, veh/h		397			578			433				
Approach Delay, s/veh		6.8			8.3			9.8				
Approach LOS		A			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		17.6				17.6		11.9
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		7.0				10.6		6.0
Green Ext Time (p_c), s		1.5				1.5		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		8.4
HCM 2010 LOS		A

Two Way Analysis cannot be performed on Signalized Intersection.

Intersection	
Int Delay, s/veh	8.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	20	549	100	5	339	5	100	10	10	5	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	20	7	2	2	15	2	3	30	2	20	60	2
Mvmt Flow	23	624	114	6	385	6	114	11	11	6	6	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	391	0	0	738	0	0	1134	1128	681	1137	1182	388
Stage 1	-	-	-	-	-	-	726	726	-	399	399	-
Stage 2	-	-	-	-	-	-	408	402	-	738	783	-
Critical Hdwy	4.3	-	-	4.12	-	-	7.13	6.8	6.22	7.3	7.1	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.8	-	6.3	6.1	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.8	-	6.3	6.1	-
Follow-up Hdwy	2.38	-	-	2.218	-	-	3.527	4.27	3.318	3.68	4.54	3.318
Pot Cap-1 Maneuver	1076	-	-	868	-	-	179	182	450	165	148	660
Stage 1	-	-	-	-	-	-	414	390	-	593	513	-
Stage 2	-	-	-	-	-	-	618	555	-	383	331	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1076	-	-	868	-	-	165	174	450	148	141	660
Mov Cap-2 Maneuver	-	-	-	-	-	-	165	174	-	148	141	-
Stage 1	-	-	-	-	-	-	399	376	-	571	508	-
Stage 2	-	-	-	-	-	-	595	550	-	349	319	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	74.3	21.8
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	175	1076	-	-	868	-	-	237
HCM Lane V/C Ratio	0.779	0.021	-	-	0.007	-	-	0.096
HCM Control Delay (s)	74.3	8.4	0	-	9.2	0	-	21.8
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	5.1	0.1	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	139	450	5	10	280	5	5	5	5	5	10	109
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	89	89	89	88	88	88	88	88	88
Heavy Vehicles, %	22	2	40	10	5	100	100	20	20	2	2	28
Mvmt Flow	158	511	6	11	315	6	6	6	6	6	11	124

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	320	0	0	517	0	0	1238	1173	514	1176	1173	317
Stage 1	-	-	-	-	-	-	830	830	-	340	340	-
Stage 2	-	-	-	-	-	-	408	343	-	836	833	-
Critical Hdwy	4.32	-	-	4.2	-	-	8.1	6.7	6.4	7.12	6.52	6.48
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	5.7	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	5.7	-	6.12	5.52	-
Follow-up Hdwy	2.398	-	-	2.29	-	-	4.4	4.18	3.48	3.518	4.018	3.552
Pot Cap-1 Maneuver	1135	-	-	1009	-	-	98	178	526	168	192	667
Stage 1	-	-	-	-	-	-	253	361	-	675	639	-
Stage 2	-	-	-	-	-	-	465	607	-	362	384	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1135	-	-	1009	-	-	67	152	526	143	163	667
Mov Cap-2 Maneuver	-	-	-	-	-	-	67	152	-	143	163	-
Stage 1	-	-	-	-	-	-	218	311	-	581	632	-
Stage 2	-	-	-	-	-	-	368	600	-	303	331	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	0.3	37.4	15.7
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	128	1135	-	-	1009	-	-	477
HCM Lane V/C Ratio	0.133	0.139	-	-	0.011	-	-	0.295
HCM Control Delay (s)	37.4	8.7	-	-	8.6	-	-	15.7
HCM Lane LOS	E	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0.5	-	-	0	-	-	1.2

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	5	82	34	0	90	82	5	0	34	5	110	0	5	5	5
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.91	0.91	0.91	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	93	85	2	2	93	2	2	85	2	5	2	2	2	2
Mvmt Flow	0	6	93	39	0	102	93	6	0	37	5	121	0	6	6	6
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.5	9.4	10.9	8
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	23%	4%	51%	33%
Vol Thru, %	3%	68%	46%	33%
Vol Right, %	74%	28%	3%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	149	121	177	15
LT Vol	5	82	82	5
Through Vol	110	34	5	5
RT Vol	34	5	90	5
Lane Flow Rate	164	138	201	17
Geometry Grp	1	1	1	1
Degree of Util (X)	0.262	0.173	0.263	0.023
Departure Headway (Hd)	5.753	4.541	4.706	4.84
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	622	788	762	735
Service Time	3.803	2.58	2.741	2.902
HCM Lane V/C Ratio	0.264	0.175	0.264	0.023
HCM Control Delay	10.9	8.5	9.4	8
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1	0.6	1.1	0.1

Two Way Analysis cannot be performed on an All Way Stop Intersection.

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	182	10	30	172	5	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	43	30	2	45	2	10
Mvmt Flow	207	11	34	195	6	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	218	0	477	213
Stage 1	-	-	-	-	213	-
Stage 2	-	-	-	-	264	-
Critical Hdwy	-	-	4.12	-	6.42	6.3
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.39
Pot Cap-1 Maneuver	-	-	1352	-	547	807
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	780	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1352	-	532	807
Mov Cap-2 Maneuver	-	-	-	-	532	-
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	758	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	752	-	-	1352	-
HCM Lane V/C Ratio	0.053	-	-	0.025	-
HCM Control Delay (s)	10.1	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	112	90	20	120	100	30	10	130	120	20	170	102
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	1131	1752	1900	1827	1816	1900	1863	1775	1900	1863	1474	1900
Adj Flow Rate, veh/h	127	102	23	136	114	34	11	148	136	23	193	116
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	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, %	68	7	7	4	3	3	2	8	8	2	3	3
Cap, veh/h	138	184	41	230	183	55	31	212	195	60	229	137
Arrive On Green	0.13	0.13	0.13	0.13	0.14	0.14	0.02	0.25	0.25	0.03	0.26	0.26
Sat Flow, veh/h	1077	1384	312	1740	1345	401	1774	853	784	1774	863	519
Grp Volume(v), veh/h	127	0	125	136	0	148	11	0	284	23	0	309
Grp Sat Flow(s),veh/h/ln	1077	0	1697	1740	0	1746	1774	0	1637	1774	0	1382
Q Serve(g_s), s	4.9	0.0	2.9	3.1	0.0	3.4	0.3	0.0	6.7	0.5	0.0	9.0
Cycle Q Clear(g_c), s	4.9	0.0	2.9	3.1	0.0	3.4	0.3	0.0	6.7	0.5	0.0	9.0
Prop In Lane	1.00		0.18	1.00		0.23	1.00		0.48	1.00		0.38
Lane Grp Cap(c), veh/h	138	0	225	230	0	238	31	0	407	60	0	366
V/C Ratio(X)	0.92	0.00	0.56	0.59	0.00	0.62	0.36	0.00	0.70	0.39	0.00	0.84
Avail Cap(c_a), veh/h	509	0	1202	822	0	1237	838	0	1546	838	0	1306
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	18.2	0.0	17.2	17.3	0.0	17.3	20.6	0.0	14.5	20.0	0.0	14.7
Incr Delay (d2), s/veh	9.5	0.0	0.8	0.9	0.0	1.0	2.6	0.0	0.8	1.5	0.0	2.1
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	1.8	0.0	1.4	1.5	0.0	1.7	0.1	0.0	3.1	0.3	0.0	3.6
LnGrp Delay(d),s/veh	27.7	0.0	18.0	18.2	0.0	18.2	23.2	0.0	15.3	21.5	0.0	16.8
LnGrp LOS	C		B	B		B	C		B	C		B
Approach Vol, veh/h		252			284			295			332	
Approach Delay, s/veh		22.9			18.2			15.6			17.1	
Approach LOS		C			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	5.5	16.5	9.7	10.6	4.8	17.2	9.5	10.8
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	4.1	* 5
Max Green Setting (Gmax), s	20.0	40.0	20.0	* 30	20.0	40.0	20.0	* 30
Max Q Clear Time (g_c+I1), s	11.5	8.7	5.1	4.9	2.3	11.0	6.9	5.4
Green Ext Time (p_c), s	0.0	0.6	0.0	0.4	0.0	0.6	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	18.3
HCM 2010 LOS	B

Notes

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

Two Way Analysis cannot be performed on Signalized Intersection.

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	109	178	40	208	0	0	0	0	5	1	84
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	91	91	91	88	88	88	88	88	88
Heavy Vehicles, %	2	8	46	2	36	2	2	2	2	2	2	6
Mvmt Flow	0	115	187	44	229	0	0	0	0	6	1	95

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	229	0	0	302	0	0	525	524	208	524	618	229
Stage 1	-	-	-	-	-	-	208	208	-	316	316	-
Stage 2	-	-	-	-	-	-	317	316	-	208	302	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.354
Pot Cap-1 Maneuver	1339	-	-	1259	-	-	463	458	832	464	405	800
Stage 1	-	-	-	-	-	-	794	730	-	695	655	-
Stage 2	-	-	-	-	-	-	694	655	-	794	664	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1339	-	-	1259	-	-	394	440	832	450	389	800
Mov Cap-2 Maneuver	-	-	-	-	-	-	394	440	-	450	389	-
Stage 1	-	-	-	-	-	-	794	730	-	695	629	-
Stage 2	-	-	-	-	-	-	586	629	-	794	664	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.3	0	10.3
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1339	-	-	1259	-	-	439	800
HCM Lane V/C Ratio	-	-	-	-	0.035	-	-	0.016	0.119
HCM Control Delay (s)	0	0	-	-	8	0	-	13.3	10.1
HCM Lane LOS	A	A	-	-	A	A	-	B	B
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0	0.4

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	60	54	0	90	5	158	1	30	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	3	15	2	2	2	45	2	2	2	2	2
Mvmt Flow	0	68	61	0	102	6	180	1	34	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	102	0	-	68	0	0	170	170	68
Stage 1	-	-	-	-	-	-	68	68	-
Stage 2	-	-	-	-	-	-	102	102	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.85	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.85	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.85	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.905	4.018	3.318
Pot Cap-1 Maneuver	1490	-	0	1533	-	0	731	723	995
Stage 1	-	-	0	-	-	0	856	838	-
Stage 2	-	-	0	-	-	0	825	811	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1490	-	-	1533	-	-	731	0	995
Mov Cap-2 Maneuver	-	-	-	-	-	-	731	0	-
Stage 1	-	-	-	-	-	-	856	0	-
Stage 2	-	-	-	-	-	-	825	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	763	1490	-	1533	-
HCM Lane V/C Ratio	0.281	-	-	-	-
HCM Control Delay (s)	11.6	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	1.2	0	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	335	320	0	735	156	0	0	0	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	90	90	90	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	40	2	2
Mvmt Flow	0	381	364	0	817	173	0	0	0	6	0	6

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	817	0	0	744	0	0	1380	1561	817
Stage 1	-	-	-	-	-	-	817	817	-
Stage 2	-	-	-	-	-	-	563	744	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.8	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.86	4.018	3.318
Pot Cap-1 Maneuver	811	-	-	864	-	0	132	112	376
Stage 1	-	-	-	-	-	0	375	390	-
Stage 2	-	-	-	-	-	0	502	421	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	811	-	-	864	-	-	132	0	376
Mov Cap-2 Maneuver	-	-	-	-	-	-	132	0	-
Stage 1	-	-	-	-	-	-	375	0	-
Stage 2	-	-	-	-	-	-	502	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	811	-	-	864	-	132	376
HCM Lane V/C Ratio	-	-	-	-	-	0.043	0.015
HCM Control Delay (s)	0	-	-	0	-	33.5	14.7
HCM Lane LOS	A	-	-	A	-	D	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.1	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	320	20	0	541	20	350	0	241	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1854	1900	0	1863	1863	1900	1863	1845			
Adj Flow Rate, veh/h	0	352	0	0	569	21	385	0	265			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.91	0.91	0.91	0.95	0.95	0.95	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	2	3	2	3			
Cap, veh/h	0	721	0	0	724	615	492	0	434			
Arrive On Green	0.00	0.39	0.00	0.00	0.39	0.39	0.28	0.00	0.28			
Sat Flow, veh/h	0	1854	0	0	1863	1583	1774	0	1568			
Grp Volume(v), veh/h	0	352	0	0	569	21	385	0	265			
Grp Sat Flow(s),veh/h/ln	0	1854	0	0	1863	1583	1774	0	1568			
Q Serve(g_s), s	0.0	4.1	0.0	0.0	7.7	0.2	5.8	0.0	4.2			
Cycle Q Clear(g_c), s	0.0	4.1	0.0	0.0	7.7	0.2	5.8	0.0	4.2			
Prop In Lane	0.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	721	0	0	724	615	492	0	434			
V/C Ratio(X)	0.00	0.49	0.00	0.00	0.79	0.03	0.78	0.00	0.61			
Avail Cap(c_a), veh/h	0	2583	0	0	2595	2206	927	0	819			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	6.6	0.0	0.0	7.7	5.4	9.6	0.0	9.0			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.7	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			
%ile BackOfQ(50%),veh/ln	0.0	2.1	0.0	0.0	3.9	0.1	2.9	0.0	1.8			
LnGrp Delay(d),s/veh	0.0	6.8	0.0	0.0	8.5	5.4	10.6	0.0	9.5			
LnGrp LOS		A			A	A	B		A			
Approach Vol, veh/h		352			590			650				
Approach Delay, s/veh		6.8			8.3			10.2				
Approach LOS		A			A			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		16.7				16.7		12.1
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		6.1				9.7		7.8
Green Ext Time (p_c), s		1.4				1.4		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		8.8
HCM 2010 LOS		A

Two Way Analysis cannot be performed on Signalized Intersection.

Intersection	
Int Delay, s/veh	33

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	501	110	20	531	5	140	10	10	5	5	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	88	88	88	88	88	88
Heavy Vehicles, %	30	2	4	10	2	2	6	2	2	2	20	2
Mvmt Flow	11	569	125	21	559	5	159	11	11	6	6	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	564	0	0	694	0	0	1273	1261	632	1270	1321	562
Stage 1	-	-	-	-	-	-	655	655	-	604	604	-
Stage 2	-	-	-	-	-	-	618	606	-	666	717	-
Critical Hdwy	4.4	-	-	4.2	-	-	7.16	6.52	6.22	7.12	6.7	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.12	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.12	5.7	-
Follow-up Hdwy	2.47	-	-	2.29	-	-	3.554	4.018	3.318	3.518	4.18	3.318
Pot Cap-1 Maneuver	882	-	-	865	-	-	~ 141	170	480	145	144	526
Stage 1	-	-	-	-	-	-	448	463	-	485	460	-
Stage 2	-	-	-	-	-	-	470	487	-	449	408	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	882	-	-	865	-	-	~ 125	161	480	128	136	526
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 125	161	-	128	136	-
Stage 1	-	-	-	-	-	-	439	453	-	475	444	-
Stage 2	-	-	-	-	-	-	428	470	-	418	399	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	267.9	20.6
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	133	882	-	-	865	-	-	264
HCM Lane V/C Ratio	1.367	0.013	-	-	0.024	-	-	0.129
HCM Control Delay (s)	267.9	9.1	0	-	9.3	0	-	20.6
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	11.9	0	-	-	0.1	-	-	0.4

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	51	540	5	5	540	5	5	5	10	5	10	81
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	88	88	88	88	88	88
Heavy Vehicles, %	4	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	614	6	5	568	5	6	6	11	6	11	92

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	574	0	0	619	0	0	1365	1316	616	1323	1317	571
Stage 1	-	-	-	-	-	-	732	732	-	582	582	-
Stage 2	-	-	-	-	-	-	633	584	-	741	735	-
Critical Hdwy	4.14	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.236	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	989	-	-	961	-	-	125	158	491	133	157	520
Stage 1	-	-	-	-	-	-	413	427	-	499	499	-
Stage 2	-	-	-	-	-	-	468	498	-	408	425	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	989	-	-	961	-	-	92	148	491	120	147	520
Mov Cap-2 Maneuver	-	-	-	-	-	-	92	148	-	120	147	-
Stage 1	-	-	-	-	-	-	389	402	-	470	496	-
Stage 2	-	-	-	-	-	-	374	495	-	370	400	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	27.3	19.2
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	184	989	-	-	961	-	-	362
HCM Lane V/C Ratio	0.124	0.059	-	-	0.005	-	-	0.301
HCM Control Delay (s)	27.3	8.9	-	-	8.8	-	-	19.2
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0	-	-	1.2

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	5	8	6	0	80	8	5	0	6	5	50	0	5	5	5
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	38	17	2	2	38	2	2	17	2	2	2	2	2	2
Mvmt Flow	0	6	9	7	0	91	9	6	0	7	6	57	0	6	6	6
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.9	7.4	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	26%	86%	33%
Vol Thru, %	8%	42%	9%	33%
Vol Right, %	82%	32%	5%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	61	19	93	15
LT Vol	5	8	8	5
Through Vol	50	6	5	5
RT Vol	6	5	80	5
Lane Flow Rate	69	22	106	17
Geometry Grp	1	1	1	1
Degree of Util (X)	0.076	0.024	0.124	0.019
Departure Headway (Hd)	3.95	4.029	4.241	4.075
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	896	880	842	866
Service Time	2.021	2.091	2.28	2.157
HCM Lane V/C Ratio	0.077	0.025	0.126	0.02
HCM Control Delay	7.4	7.2	7.9	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.4	0.1

Two Way Analysis cannot be performed on an All Way Stop Intersection.

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	63	5	30	103	5	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	2	2	3	2	2
Mvmt Flow	72	6	34	117	6	45

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	77	0	259	74
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	185	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1522	-	730	988
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	847	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1522	-	712	988
Mov Cap-2 Maneuver	-	-	-	-	712	-
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	947	-	-	1522	-
HCM Lane V/C Ratio	0.054	-	-	0.022	-
HCM Control Delay (s)	9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	33	70	20	120	80	40	20	190	110	20	130	43
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	1743	1863	1900	1863	1863	1900	1863	1843	1900	1727	1805	1900
Adj Flow Rate, veh/h	38	80	23	132	88	44	23	216	125	22	141	47
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.88	0.88	0.88	0.92	0.92	0.92
Percent Heavy Veh, %	9	2	2	2	2	2	2	2	2	10	4	4
Cap, veh/h	155	165	47	237	160	80	60	267	154	53	314	105
Arrive On Green	0.09	0.12	0.12	0.13	0.14	0.14	0.03	0.24	0.24	0.03	0.24	0.24
Sat Flow, veh/h	1660	1392	400	1774	1172	586	1774	1095	634	1645	1297	432
Grp Volume(v), veh/h	38	0	103	132	0	132	23	0	341	22	0	188
Grp Sat Flow(s),veh/h/ln	1660	0	1792	1774	0	1757	1774	0	1729	1645	0	1729
Q Serve(g_s), s	0.9	0.0	2.2	2.8	0.0	2.9	0.5	0.0	7.6	0.5	0.0	3.8
Cycle Q Clear(g_c), s	0.9	0.0	2.2	2.8	0.0	2.9	0.5	0.0	7.6	0.5	0.0	3.8
Prop In Lane	1.00		0.22	1.00		0.33	1.00		0.37	1.00		0.25
Lane Grp Cap(c), veh/h	155	0	212	237	0	240	60	0	421	53	0	419
V/C Ratio(X)	0.25	0.00	0.49	0.56	0.00	0.55	0.38	0.00	0.81	0.41	0.00	0.45
Avail Cap(c_a), veh/h	780	0	1323	873	0	1297	873	0	1702	809	0	1701
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	17.1	0.0	16.8	16.5	0.0	16.4	19.2	0.0	14.5	19.3	0.0	13.1
Incr Delay (d2), s/veh	0.3	0.0	0.6	0.8	0.0	0.7	1.5	0.0	1.4	1.9	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	0.4	0.0	1.1	1.4	0.0	1.4	0.3	0.0	3.8	0.3	0.0	1.8
LnGrp Delay(d),s/veh	17.4	0.0	17.4	17.3	0.0	17.1	20.7	0.0	15.9	21.2	0.0	13.4
LnGrp LOS	B		B	B		B	C		B	C		B
Approach Vol, veh/h		141			264			364			210	
Approach Delay, s/veh		17.4			17.2			16.2			14.2	
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	5.4	15.9	9.5	9.8	5.5	15.8	8.8	10.5
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	* 5	* 5
Max Green Setting (Gmax), s	20.3	40.0	20.0	* 30	20.0	40.0	* 19	* 30
Max Q Clear Time (g_c+I1), s	2.5	9.6	4.8	4.2	2.5	5.8	2.9	4.9
Green Ext Time (p_c), s	0.0	0.5	0.0	0.1	0.0	0.5	0.1	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Notes

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

Two Way Analysis cannot be performed on Signalized Intersection.

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	140	103	40	153	0	0	0	0	5	4	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	5	5	7	2	2	2	2	2	75	3
Mvmt Flow	0	157	116	45	174	0	0	0	0	6	5	68

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	174	0	0	273	0	0	482	480	215	480	538	174
Stage 1	-	-	-	-	-	-	215	215	-	265	265	-
Stage 2	-	-	-	-	-	-	267	265	-	215	273	-
Critical Hdwy	4.12	-	-	4.15	-	-	7.12	6.52	6.22	7.12	7.25	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	6.25	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	6.25	-
Follow-up Hdwy	2.218	-	-	2.245	-	-	3.518	4.018	3.318	3.518	4.675	3.327
Pot Cap-1 Maneuver	1403	-	-	1273	-	-	495	485	825	496	362	867
Stage 1	-	-	-	-	-	-	787	725	-	740	575	-
Stage 2	-	-	-	-	-	-	738	689	-	787	569	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1403	-	-	1273	-	-	438	466	825	481	348	867
Mov Cap-2 Maneuver	-	-	-	-	-	-	438	466	-	481	348	-
Stage 1	-	-	-	-	-	-	787	725	-	740	553	-
Stage 2	-	-	-	-	-	-	648	662	-	787	569	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.6	0	10.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1403	-	-	1273	-	-	411	867
HCM Lane V/C Ratio	-	-	-	-	0.036	-	-	0.025	0.079
HCM Control Delay (s)	0	0	-	-	7.9	0	-	14	9.5
HCM Lane LOS	A	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0.1	0.3

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	70	75	0	80	5	113	0	50	0	0	0
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	3	2	2	2	2	2
Mvmt Flow	0	80	85	0	91	6	128	0	57	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	91	0	-	80	0	0	171	171	80
Stage 1	-	-	-	-	-	-	80	80	-
Stage 2	-	-	-	-	-	-	91	91	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.43	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.527	4.018	3.318
Pot Cap-1 Maneuver	1504	-	0	1518	-	0	817	722	980
Stage 1	-	-	0	-	-	0	941	828	-
Stage 2	-	-	0	-	-	0	930	820	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1504	-	-	1518	-	-	817	0	980
Mov Cap-2 Maneuver	-	-	-	-	-	-	817	0	-
Stage 1	-	-	-	-	-	-	941	0	-
Stage 2	-	-	-	-	-	-	930	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	861	1504	-	1518	-
HCM Lane V/C Ratio	0.215	-	-	-	-
HCM Control Delay (s)	10.3	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	0.8	0	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	353	240	0	423	254	0	0	0	15	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	90	90	90	88	88	88
Heavy Vehicles, %	2	4	2	2	8	18	2	2	2	73	2	10
Mvmt Flow	0	401	273	0	481	289	0	0	0	17	0	11

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	481	0	0	674	0	0	1019	1155	481
Stage 1	-	-	-	-	-	-	481	481	-
Stage 2	-	-	-	-	-	-	538	674	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.13	6.52	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	4.157	4.018	3.39
Pot Cap-1 Maneuver	1082	-	-	917	-	0	196	197	569
Stage 1	-	-	-	-	-	0	498	554	-
Stage 2	-	-	-	-	-	0	465	454	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	1082	-	-	917	-	-	196	0	569
Mov Cap-2 Maneuver	-	-	-	-	-	-	196	0	-
Stage 1	-	-	-	-	-	-	498	0	-
Stage 2	-	-	-	-	-	-	465	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	19.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	1082	-	-	917	-	196	569
HCM Lane V/C Ratio	-	-	-	-	-	0.087	0.02
HCM Control Delay (s)	0	-	-	0	-	25.1	11.5
HCM Lane LOS	A	-	-	A	-	D	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.3	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	348	20	0	477	25	200	1	174	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1780	1900	0	1681	1319	1900	1786	1583			
Adj Flow Rate, veh/h	0	395	0	0	542	28	227	1	198			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88			
Percent Heavy Veh, %	0	7	7	0	13	44	20	100	20			
Cap, veh/h	0	719	0	0	680	453	451	2	358			
Arrive On Green	0.00	0.40	0.00	0.00	0.40	0.40	0.27	0.27	0.27			
Sat Flow, veh/h	0	1780	0	0	1681	1122	1693	7	1346			
Grp Volume(v), veh/h	0	395	0	0	542	28	228	0	198			
Grp Sat Flow(s),veh/h/ln	0	1780	0	0	1681	1122	1701	0	1346			
Q Serve(g_s), s	0.0	4.9	0.0	0.0	8.3	0.4	3.3	0.0	3.7			
Cycle Q Clear(g_c), s	0.0	4.9	0.0	0.0	8.3	0.4	3.3	0.0	3.7			
Prop In Lane	0.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	719	0	0	680	453	453	0	358			
V/C Ratio(X)	0.00	0.55	0.00	0.00	0.80	0.06	0.50	0.00	0.55			
Avail Cap(c_a), veh/h	0	2446	0	0	2311	1541	876	0	694			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	6.6	0.0	0.0	7.6	5.3	9.1	0.0	9.2			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.8	0.0	0.3	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			
%ile BackOfQ(50%),veh/ln	0.0	2.5	0.0	0.0	3.9	0.1	1.6	0.0	1.4			
LnGrp Delay(d),s/veh	0.0	6.9	0.0	0.0	8.5	5.3	9.4	0.0	9.7			
LnGrp LOS		A			A	A	A		A			
Approach Vol, veh/h		395			570			426				
Approach Delay, s/veh		6.9			8.3			9.5				
Approach LOS		A			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		17.3				17.3		11.8
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		6.9				10.3		5.7
Green Ext Time (p_c), s		1.5				1.5		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		8.3
HCM 2010 LOS		A

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	20	542	100	5	332	5	100	10	10	5	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	20	6	2	2	13	2	3	30	2	20	60	2
Mvmt Flow	23	616	114	6	377	6	114	11	11	6	6	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	383	0	0	730	0	0	1118	1112	673	1121	1166	380
Stage 1	-	-	-	-	-	-	718	718	-	391	391	-
Stage 2	-	-	-	-	-	-	400	394	-	730	775	-
Critical Hdwy	4.3	-	-	4.12	-	-	7.13	6.8	6.22	7.3	7.1	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.8	-	6.3	6.1	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.8	-	6.3	6.1	-
Follow-up Hdwy	2.38	-	-	2.218	-	-	3.527	4.27	3.318	3.68	4.54	3.318
Pot Cap-1 Maneuver	1084	-	-	874	-	-	183	186	455	169	152	667
Stage 1	-	-	-	-	-	-	419	394	-	599	518	-
Stage 2	-	-	-	-	-	-	624	559	-	387	334	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1084	-	-	874	-	-	169	178	455	151	145	667
Mov Cap-2 Maneuver	-	-	-	-	-	-	169	178	-	151	145	-
Stage 1	-	-	-	-	-	-	404	380	-	577	513	-
Stage 2	-	-	-	-	-	-	601	554	-	353	322	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	70.3	21.4
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	179	1084	-	-	874	-	-	242
HCM Lane V/C Ratio	0.762	0.021	-	-	0.007	-	-	0.094
HCM Control Delay (s)	70.3	8.4	0	-	9.1	0	-	21.4
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	5	0.1	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	130	452	5	10	282	5	5	5	5	5	10	100
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	89	89	89	88	88	88	88	88	88
Heavy Vehicles, %	17	2	40	10	6	100	100	20	20	2	2	22
Mvmt Flow	148	514	6	11	317	6	6	6	6	6	11	114

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	322	0	0	519	0	0	1217	1157	516	1160	1157	320
Stage 1	-	-	-	-	-	-	812	812	-	342	342	-
Stage 2	-	-	-	-	-	-	405	345	-	818	815	-
Critical Hdwy	4.27	-	-	4.2	-	-	8.1	6.7	6.4	7.12	6.52	6.42
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	5.7	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	5.7	-	6.12	5.52	-
Follow-up Hdwy	2.353	-	-	2.29	-	-	4.4	4.18	3.48	3.518	4.018	3.498
Pot Cap-1 Maneuver	1158	-	-	1007	-	-	102	182	525	172	196	677
Stage 1	-	-	-	-	-	-	260	368	-	673	638	-
Stage 2	-	-	-	-	-	-	467	605	-	370	391	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1158	-	-	1007	-	-	72	157	525	148	169	677
Mov Cap-2 Maneuver	-	-	-	-	-	-	72	157	-	148	169	-
Stage 1	-	-	-	-	-	-	227	321	-	587	631	-
Stage 2	-	-	-	-	-	-	377	598	-	314	341	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.3	35.5	15.3
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	135	1158	-	-	1007	-	-	478
HCM Lane V/C Ratio	0.126	0.128	-	-	0.011	-	-	0.273
HCM Control Delay (s)	35.5	8.6	-	-	8.6	-	-	15.3
HCM Lane LOS	E	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0.4	-	-	0	-	-	1.1

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	5	59	25	0	90	59	5	0	25	5	110	0	5	5	5
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.91	0.91	0.91	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	90	80	2	2	90	2	2	80	2	5	2	2	2	2
Mvmt Flow	0	6	67	28	0	102	67	6	0	27	5	121	0	6	6	6
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	9	10.2	7.8
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	18%	6%	58%	33%
Vol Thru, %	4%	66%	38%	33%
Vol Right, %	79%	28%	3%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	89	154	15
LT Vol	5	59	59	5
Through Vol	110	25	5	5
RT Vol	25	5	90	5
Lane Flow Rate	154	101	175	17
Geometry Grp	1	1	1	1
Degree of Util (X)	0.234	0.125	0.225	0.022
Departure Headway (Hd)	5.484	4.461	4.626	4.661
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	654	804	777	766
Service Time	3.519	2.488	2.649	2.703
HCM Lane V/C Ratio	0.235	0.126	0.225	0.022
HCM Control Delay	10.2	8.1	9	7.8
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	0.9	0.4	0.9	0.1

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	159	10	30	149	5	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	35	30	2	37	2	10
Mvmt Flow	181	11	34	169	6	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	192	0	424	186
Stage 1	-	-	-	-	186	-
Stage 2	-	-	-	-	238	-
Critical Hdwy	-	-	4.12	-	6.42	6.3
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.39
Pot Cap-1 Maneuver	-	-	1381	-	587	836
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	802	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1381	-	571	836
Mov Cap-2 Maneuver	-	-	-	-	571	-
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	780	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	784	-	-	1381	-
HCM Lane V/C Ratio	0.051	-	-	0.025	-
HCM Control Delay (s)	9.8	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	89	90	20	120	100	30	10	132	120	20	172	79
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	1188	1752	1900	1827	1816	1900	1863	1758	1900	1863	1549	1900
Adj Flow Rate, veh/h	101	102	23	136	114	34	11	150	136	23	195	90
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	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, %	60	7	7	4	3	3	2	10	10	2	4	4
Cap, veh/h	133	182	41	237	201	60	31	188	170	60	238	110
Arrive On Green	0.12	0.13	0.13	0.14	0.15	0.15	0.02	0.22	0.22	0.03	0.24	0.24
Sat Flow, veh/h	1131	1384	312	1740	1345	401	1774	850	771	1774	1004	463
Grp Volume(v), veh/h	101	0	125	136	0	148	11	0	286	23	0	285
Grp Sat Flow(s),veh/h/ln	1131	0	1697	1740	0	1746	1774	0	1622	1774	0	1468
Q Serve(g_s), s	3.5	0.0	2.8	2.9	0.0	3.2	0.2	0.0	6.7	0.5	0.0	7.4
Cycle Q Clear(g_c), s	3.5	0.0	2.8	2.9	0.0	3.2	0.2	0.0	6.7	0.5	0.0	7.4
Prop In Lane	1.00		0.18	1.00		0.23	1.00		0.48	1.00		0.32
Lane Grp Cap(c), veh/h	133	0	222	237	0	261	31	0	358	60	0	348
V/C Ratio(X)	0.76	0.00	0.56	0.57	0.00	0.57	0.36	0.00	0.80	0.38	0.00	0.82
Avail Cap(c_a), veh/h	564	0	1268	867	0	1305	884	0	1616	884	0	1463
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	17.1	0.0	16.4	16.2	0.0	15.9	19.5	0.0	14.8	19.0	0.0	14.5
Incr Delay (d2), s/veh	3.3	0.0	0.8	0.8	0.0	0.7	2.6	0.0	1.6	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	1.2	0.0	1.3	1.5	0.0	1.6	0.1	0.0	3.1	0.3	0.0	3.1
LnGrp Delay(d),s/veh	20.4	0.0	17.2	17.1	0.0	16.6	22.1	0.0	16.4	20.5	0.0	16.3
LnGrp LOS	C		B	B		B	C		B	C		B
Approach Vol, veh/h		226			284			297			308	
Approach Delay, s/veh		18.6			16.8			16.6			16.6	
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	5.5	14.8	9.6	10.3	4.8	15.5	8.8	11.0
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	4.1	* 5
Max Green Setting (Gmax), s	20.0	40.0	20.0	* 30	20.0	40.0	20.0	* 30
Max Q Clear Time (g_c+I1), s	12.5	8.7	4.9	4.8	2.2	9.4	5.5	5.2
Green Ext Time (p_c), s	0.0	0.5	0.0	0.4	0.0	0.5	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	108	158	40	188	0	0	0	0	5	1	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	91	91	91	88	88	88	88	88	88
Heavy Vehicles, %	2	7	39	2	29	2	2	2	2	2	2	5
Mvmt Flow	0	114	166	44	207	0	0	0	0	6	1	94

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	207	0	0	280	0	0	492	492	197	492	575	207
Stage 1	-	-	-	-	-	-	197	197	-	295	295	-
Stage 2	-	-	-	-	-	-	295	295	-	197	280	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.345
Pot Cap-1 Maneuver	1364	-	-	1283	-	-	487	478	844	487	429	826
Stage 1	-	-	-	-	-	-	805	738	-	713	669	-
Stage 2	-	-	-	-	-	-	713	669	-	805	679	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1364	-	-	1283	-	-	418	459	844	472	412	826
Mov Cap-2 Maneuver	-	-	-	-	-	-	418	459	-	472	412	-
Stage 1	-	-	-	-	-	-	805	738	-	713	643	-
Stage 2	-	-	-	-	-	-	606	643	-	805	679	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.4	0	10.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1364	-	-	1283	-	-	461	826
HCM Lane V/C Ratio	-	-	-	-	0.034	-	-	0.015	0.114
HCM Control Delay (s)	0	0	-	-	7.9	0	-	12.9	9.9
HCM Lane LOS	A	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0	0.4

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	60	53	0	90	5	138	1	30	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	3	13	2	2	2	37	2	2	2	2	2
Mvmt Flow	0	68	60	0	102	6	157	1	34	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	102	0	-	68	0	0	170	170	68
Stage 1	-	-	-	-	-	-	68	68	-
Stage 2	-	-	-	-	-	-	102	102	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.77	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.77	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.77	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.833	4.018	3.318
Pot Cap-1 Maneuver	1490	-	0	1533	-	0	746	723	995
Stage 1	-	-	0	-	-	0	873	838	-
Stage 2	-	-	0	-	-	0	842	811	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1490	-	-	1533	-	-	746	0	995
Mov Cap-2 Maneuver	-	-	-	-	-	-	746	0	-
Stage 1	-	-	-	-	-	-	873	0	-
Stage 2	-	-	-	-	-	-	842	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	781	1490	-	1533	-
HCM Lane V/C Ratio	0.246	-	-	-	-
HCM Control Delay (s)	11.1	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	1	0	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	335	320	0	735	156	0	0	0	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	90	90	90	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	40	2	2
Mvmt Flow	0	381	364	0	817	173	0	0	0	6	0	6

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	817	0	0	744	0	0	1380	1561	817
Stage 1	-	-	-	-	-	-	817	817	-
Stage 2	-	-	-	-	-	-	563	744	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.8	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.86	4.018	3.318
Pot Cap-1 Maneuver	811	-	-	864	-	0	132	112	376
Stage 1	-	-	-	-	-	0	375	390	-
Stage 2	-	-	-	-	-	0	502	421	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	811	-	-	864	-	-	132	0	376
Mov Cap-2 Maneuver	-	-	-	-	-	-	132	0	-
Stage 1	-	-	-	-	-	-	375	0	-
Stage 2	-	-	-	-	-	-	502	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	811	-	-	864	-	132	376
HCM Lane V/C Ratio	-	-	-	-	-	0.043	0.015
HCM Control Delay (s)	0	-	-	0	-	33.5	14.7
HCM Lane LOS	A	-	-	A	-	D	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.1	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	320	20	0	541	20	350	0	241	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1854	1900	0	1863	1863	1900	1863	1845			
Adj Flow Rate, veh/h	0	352	0	0	569	21	385	0	265			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.91	0.91	0.91	0.95	0.95	0.95	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	2	3	2	3			
Cap, veh/h	0	721	0	0	724	615	492	0	434			
Arrive On Green	0.00	0.39	0.00	0.00	0.39	0.39	0.28	0.00	0.28			
Sat Flow, veh/h	0	1854	0	0	1863	1583	1774	0	1568			
Grp Volume(v), veh/h	0	352	0	0	569	21	385	0	265			
Grp Sat Flow(s),veh/h/ln	0	1854	0	0	1863	1583	1774	0	1568			
Q Serve(g_s), s	0.0	4.1	0.0	0.0	7.7	0.2	5.8	0.0	4.2			
Cycle Q Clear(g_c), s	0.0	4.1	0.0	0.0	7.7	0.2	5.8	0.0	4.2			
Prop In Lane	0.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	721	0	0	724	615	492	0	434			
V/C Ratio(X)	0.00	0.49	0.00	0.00	0.79	0.03	0.78	0.00	0.61			
Avail Cap(c_a), veh/h	0	2583	0	0	2595	2206	927	0	819			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	6.6	0.0	0.0	7.7	5.4	9.6	0.0	9.0			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.7	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			
%ile BackOfQ(50%),veh/ln	0.0	2.1	0.0	0.0	3.9	0.1	2.9	0.0	1.8			
LnGrp Delay(d),s/veh	0.0	6.8	0.0	0.0	8.5	5.4	10.6	0.0	9.5			
LnGrp LOS		A			A	A	B		A			
Approach Vol, veh/h		352			590			650				
Approach Delay, s/veh		6.8			8.3			10.2				
Approach LOS		A			A			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		16.7				16.7		12.1
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		6.1				9.7		7.8
Green Ext Time (p_c), s		1.4				1.4		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		8.8
HCM 2010 LOS		A

Intersection	
Int Delay, s/veh	33

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	501	110	20	531	5	140	10	10	5	5	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	88	88	88	88	88	88
Heavy Vehicles, %	30	2	4	10	2	2	6	2	2	2	20	2
Mvmt Flow	11	569	125	21	559	5	159	11	11	6	6	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	564	0	0	694	0	0	1273	1261	632	1270	1321	562
Stage 1	-	-	-	-	-	-	655	655	-	604	604	-
Stage 2	-	-	-	-	-	-	618	606	-	666	717	-
Critical Hdwy	4.4	-	-	4.2	-	-	7.16	6.52	6.22	7.12	6.7	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.12	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.12	5.7	-
Follow-up Hdwy	2.47	-	-	2.29	-	-	3.554	4.018	3.318	3.518	4.18	3.318
Pot Cap-1 Maneuver	882	-	-	865	-	-	~ 141	170	480	145	144	526
Stage 1	-	-	-	-	-	-	448	463	-	485	460	-
Stage 2	-	-	-	-	-	-	470	487	-	449	408	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	882	-	-	865	-	-	~ 125	161	480	128	136	526
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 125	161	-	128	136	-
Stage 1	-	-	-	-	-	-	439	453	-	475	444	-
Stage 2	-	-	-	-	-	-	428	470	-	418	399	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	267.9	20.6
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	133	882	-	-	865	-	-	264
HCM Lane V/C Ratio	1.367	0.013	-	-	0.024	-	-	0.129
HCM Control Delay (s)	267.9	9.1	0	-	9.3	0	-	20.6
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	11.9	0	-	-	0.1	-	-	0.4

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	51	540	5	5	540	5	5	5	10	5	10	81
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	88	88	88	88	88	88
Heavy Vehicles, %	4	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	614	6	5	568	5	6	6	11	6	11	92

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	574	0	0	619	0	0	1365	1316	616	1323	1317	571
Stage 1	-	-	-	-	-	-	732	732	-	582	582	-
Stage 2	-	-	-	-	-	-	633	584	-	741	735	-
Critical Hdwy	4.14	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.236	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	989	-	-	961	-	-	125	158	491	133	157	520
Stage 1	-	-	-	-	-	-	413	427	-	499	499	-
Stage 2	-	-	-	-	-	-	468	498	-	408	425	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	989	-	-	961	-	-	92	148	491	120	147	520
Mov Cap-2 Maneuver	-	-	-	-	-	-	92	148	-	120	147	-
Stage 1	-	-	-	-	-	-	389	402	-	470	496	-
Stage 2	-	-	-	-	-	-	374	495	-	370	400	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	27.3	19.2
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	184	989	-	-	961	-	-	362
HCM Lane V/C Ratio	0.124	0.059	-	-	0.005	-	-	0.301
HCM Control Delay (s)	27.3	8.9	-	-	8.8	-	-	19.2
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0	-	-	1.2

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	5	7	6	0	80	7	5	0	6	5	50	0	5	5	5
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	29	17	2	2	29	2	2	17	2	2	2	2	2	2
Mvmt Flow	0	6	8	7	0	91	8	6	0	7	6	57	0	6	6	6
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.9	7.3	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	28%	87%	33%
Vol Thru, %	8%	39%	8%	33%
Vol Right, %	82%	33%	5%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	61	18	92	15
LT Vol	5	7	7	5
Through Vol	50	6	5	5
RT Vol	6	5	80	5
Lane Flow Rate	69	20	105	17
Geometry Grp	1	1	1	1
Degree of Util (X)	0.076	0.023	0.123	0.019
Departure Headway (Hd)	3.946	4.02	4.241	4.072
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	897	882	843	867
Service Time	2.018	2.082	2.281	2.153
HCM Lane V/C Ratio	0.077	0.023	0.125	0.02
HCM Control Delay	7.3	7.2	7.9	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.4	0.1

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	62	5	30	102	5	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	2	2	2	2	2
Mvmt Flow	70	6	34	116	6	45

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	76	0	257	73
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	184	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1523	-	732	989
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1523	-	714	989
Mov Cap-2 Maneuver	-	-	-	-	714	-
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	828	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	948	-	-	1523	-
HCM Lane V/C Ratio	0.054	-	-	0.022	-
HCM Control Delay (s)	9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	32	70	20	120	80	40	20	190	110	20	130	42
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	1792	1863	1900	1863	1863	1900	1863	1843	1900	1727	1814	1900
Adj Flow Rate, veh/h	36	80	23	132	88	44	23	216	125	22	141	46
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.88	0.88	0.88	0.92	0.92	0.92
Percent Heavy Veh, %	6	2	2	2	2	2	2	2	2	10	4	4
Cap, veh/h	159	165	47	237	160	80	60	267	154	53	317	104
Arrive On Green	0.09	0.12	0.12	0.13	0.14	0.14	0.03	0.24	0.24	0.03	0.24	0.24
Sat Flow, veh/h	1707	1392	400	1774	1172	586	1774	1095	634	1645	1311	428
Grp Volume(v), veh/h	36	0	103	132	0	132	23	0	341	22	0	187
Grp Sat Flow(s),veh/h/ln	1707	0	1792	1774	0	1757	1774	0	1729	1645	0	1739
Q Serve(g_s), s	0.8	0.0	2.2	2.8	0.0	2.9	0.5	0.0	7.6	0.5	0.0	3.7
Cycle Q Clear(g_c), s	0.8	0.0	2.2	2.8	0.0	2.9	0.5	0.0	7.6	0.5	0.0	3.7
Prop In Lane	1.00		0.22	1.00		0.33	1.00		0.37	1.00		0.25
Lane Grp Cap(c), veh/h	159	0	212	237	0	240	60	0	421	53	0	421
V/C Ratio(X)	0.23	0.00	0.49	0.56	0.00	0.55	0.38	0.00	0.81	0.41	0.00	0.44
Avail Cap(c_a), veh/h	802	0	1323	873	0	1297	873	0	1702	809	0	1711
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	17.1	0.0	16.8	16.5	0.0	16.4	19.2	0.0	14.5	19.3	0.0	13.1
Incr Delay (d2), s/veh	0.3	0.0	0.6	0.8	0.0	0.7	1.5	0.0	1.4	1.9	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	0.4	0.0	1.1	1.4	0.0	1.4	0.3	0.0	3.8	0.3	0.0	1.8
LnGrp Delay(d),s/veh	17.3	0.0	17.4	17.3	0.0	17.1	20.7	0.0	15.9	21.2	0.0	13.4
LnGrp LOS	B		B	B		B	C		B	C		B
Approach Vol, veh/h		139			264			364			209	
Approach Delay, s/veh		17.4			17.2			16.2			14.2	
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	5.4	15.9	9.5	9.8	5.5	15.8	8.8	10.5
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	* 5	* 5
Max Green Setting (Gmax), s	20.3	40.0	20.0	* 30	20.0	40.0	* 19	* 30
Max Q Clear Time (g_c+I1), s	12.5	9.6	4.8	4.2	2.5	5.7	2.8	4.9
Green Ext Time (p_c), s	0.0	0.5	0.0	0.1	0.0	0.5	0.1	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	140	102	40	152	0	0	0	0	5	4	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	4	5	7	2	2	2	2	2	75	3
Mvmt Flow	0	157	115	45	173	0	0	0	0	6	5	68

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	173	0	0	272	0	0	481	479	215	479	536	173
Stage 1	-	-	-	-	-	-	215	215	-	264	264	-
Stage 2	-	-	-	-	-	-	266	264	-	215	272	-
Critical Hdwy	4.12	-	-	4.15	-	-	7.12	6.52	6.22	7.12	7.25	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	6.25	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	6.25	-
Follow-up Hdwy	2.218	-	-	2.245	-	-	3.518	4.018	3.318	3.518	4.675	3.327
Pot Cap-1 Maneuver	1404	-	-	1274	-	-	495	486	825	497	363	868
Stage 1	-	-	-	-	-	-	787	725	-	741	575	-
Stage 2	-	-	-	-	-	-	739	690	-	787	570	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1404	-	-	1274	-	-	438	467	825	482	349	868
Mov Cap-2 Maneuver	-	-	-	-	-	-	438	467	-	482	349	-
Stage 1	-	-	-	-	-	-	787	725	-	741	553	-
Stage 2	-	-	-	-	-	-	649	663	-	787	570	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.7	0	10.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1404	-	-	1274	-	-	412	868
HCM Lane V/C Ratio	-	-	-	-	0.036	-	-	0.025	0.079
HCM Control Delay (s)	0	0	-	-	7.9	0	-	14	9.5
HCM Lane LOS	A	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0.1	0.3

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	70	75	0	80	5	112	0	50	0	0	0
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	80	85	0	91	6	127	0	57	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	91	0	-	80	0	0	171	171	80
Stage 1	-	-	-	-	-	-	80	80	-
Stage 2	-	-	-	-	-	-	91	91	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1504	-	0	1518	-	0	819	722	980
Stage 1	-	-	0	-	-	0	943	828	-
Stage 2	-	-	0	-	-	0	933	820	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1504	-	-	1518	-	-	819	0	980
Mov Cap-2 Maneuver	-	-	-	-	-	-	819	0	-
Stage 1	-	-	-	-	-	-	943	0	-
Stage 2	-	-	-	-	-	-	933	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	863	1504	-	1518	-
HCM Lane V/C Ratio	0.213	-	-	-	-
HCM Control Delay (s)	10.3	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	0.8	0	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	353	240	0	423	257	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	90	90	90
Heavy Vehicles, %	2	4	2	2	8	19	2	2	2
Mvmt Flow	0	401	273	0	481	292	0	0	0

Major/Minor	Major1			Major2		
Conflicting Flow All	481	0	0	674	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	1082	-	-	917	-	0
Stage 1	-	-	-	-	-	0
Stage 2	-	-	-	-	-	0
Platoon blocked, %		-	-		-	
Mov Cap-1 Maneuver	1082	-	-	917	-	-
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	SBLn1	SBLn2
Capacity (veh/h)	1082	-	-	917	-	196	569
HCM Lane V/C Ratio	-	-	-	-	-	0.087	0.02
HCM Control Delay (s)	0	-	-	0	-	25.1	11.5
HCM Lane LOS	A	-	-	A	-	D	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.3	0.1

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	15	0	10
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	30
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	88	88	88
Heavy Vehicles, %	73	2	10
Mvmt Flow	17	0	11

Major/Minor	Minor2		
Conflicting Flow All	1019	1155	481
Stage 1	481	481	-
Stage 2	538	674	-
Critical Hdwy	7.13	6.52	6.3
Critical Hdwy Stg 1	6.13	5.52	-
Critical Hdwy Stg 2	6.13	5.52	-
Follow-up Hdwy	4.157	4.018	3.39
Pot Cap-1 Maneuver	196	197	569
Stage 1	498	554	-
Stage 2	465	454	-
Platoon blocked, %			
Mov Cap-1 Maneuver	196	0	569
Mov Cap-2 Maneuver	196	0	-
Stage 1	498	0	-
Stage 2	465	0	-

Approach	SB
HCM Control Delay, s	19.7
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)	0	348	20	0	480	25	200	1	177	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1780	1900	0	1681	1319	1900	1786	1570			
Adj Flow Rate, veh/h	0	395	0	0	545	28	227	1	201			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88			
Percent Heavy Veh, %	0	7	7	0	13	44	21	100	21			
Cap, veh/h	0	722	0	0	682	455	450	2	354			
Arrive On Green	0.00	0.41	0.00	0.00	0.41	0.41	0.27	0.27	0.27			
Sat Flow, veh/h	0	1780	0	0	1681	1122	1693	7	1335			
Grp Volume(v), veh/h	0	395	0	0	545	28	228	0	201			
Grp Sat Flow(s),veh/h/ln	0	1780	0	0	1681	1122	1701	0	1335			
Q Serve(g_s), s	0.0	4.9	0.0	0.0	8.3	0.4	3.3	0.0	3.8			
Cycle Q Clear(g_c), s	0.0	4.9	0.0	0.0	8.3	0.4	3.3	0.0	3.8			
Prop In Lane	0.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	722	0	0	682	455	452	0	354			
V/C Ratio(X)	0.00	0.55	0.00	0.00	0.80	0.06	0.50	0.00	0.57			
Avail Cap(c_a), veh/h	0	2439	0	0	2304	1537	874	0	686			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	6.6	0.0	0.0	7.6	5.3	9.1	0.0	9.3			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.8	0.0	0.3	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			
%ile BackOfQ(50%),veh/ln	0.0	2.5	0.0	0.0	3.9	0.1	1.6	0.0	1.4			
LnGrp Delay(d),s/veh	0.0	6.9	0.0	0.0	8.5	5.3	9.4	0.0	9.8			
LnGrp LOS		A			A	A	A		A			
Approach Vol, veh/h		395			573			429				
Approach Delay, s/veh		6.9			8.3			9.6				
Approach LOS		A			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		17.3				17.3		11.9
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		6.9				10.3		5.8
Green Ext Time (p_c), s		1.5				1.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	20	545	100	5	335	5	100	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	20	7	2	2	14	2	3	30	2
Mvmt Flow	23	619	114	6	381	6	114	11	11

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	386	0	0	733	0	0	1125	1120	676
Stage 1	-	-	-	-	-	-	722	722	-
Stage 2	-	-	-	-	-	-	403	398	-
Critical Hdwy	4.3	-	-	4.12	-	-	7.13	6.8	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.8	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.8	-
Follow-up Hdwy	2.38	-	-	2.218	-	-	3.527	4.27	3.318
Pot Cap-1 Maneuver	1081	-	-	872	-	-	181	184	453
Stage 1	-	-	-	-	-	-	416	392	-
Stage 2	-	-	-	-	-	-	622	557	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1081	-	-	872	-	-	167	176	453
Mov Cap-2 Maneuver	-	-	-	-	-	-	167	176	-
Stage 1	-	-	-	-	-	-	401	377	-
Stage 2	-	-	-	-	-	-	599	552	-

Approach	EB	WB	NB
HCM Control Delay, s	0.3	0.1	72.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	177	1081	-	-	872	-	-	239
HCM Lane V/C Ratio	0.77	0.021	-	-	0.007	-	-	0.095
HCM Control Delay (s)	72.3	8.4	0	-	9.2	0	-	21.6
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	5	0.1	-	-	0	-	-	0.3

Intersection			
Int Delay, s/veh			

Movement	SBL	SBT	SBR
Vol, veh/h	5	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	88	88	88
Heavy Vehicles, %	20	60	2
Mvmt Flow	6	6	11

Major/Minor	Minor2		
Conflicting Flow All	1128	1173	384
Stage 1	395	395	-
Stage 2	733	778	-
Critical Hdwy	7.3	7.1	6.22
Critical Hdwy Stg 1	6.3	6.1	-
Critical Hdwy Stg 2	6.3	6.1	-
Follow-up Hdwy	3.68	4.54	3.318
Pot Cap-1 Maneuver	167	150	664
Stage 1	596	516	-
Stage 2	385	333	-
Platoon blocked, %			
Mov Cap-1 Maneuver	149	143	664
Mov Cap-2 Maneuver	149	143	-
Stage 1	574	511	-
Stage 2	351	321	-

Approach	SB
HCM Control Delay, s	21.6
HCM LOS	C

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	134	451	5	10	281	5	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	89	89	89	88	88	88
Heavy Vehicles, %	19	2	40	10	6	100	100	20	20
Mvmt Flow	152	512	6	11	316	6	6	6	6

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	321	0	0	518	0	0	1226	1164	515
Stage 1	-	-	-	-	-	-	820	820	-
Stage 2	-	-	-	-	-	-	406	344	-
Critical Hdwy	4.29	-	-	4.2	-	-	8.1	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	5.7	-
Follow-up Hdwy	2.371	-	-	2.29	-	-	4.4	4.18	3.48
Pot Cap-1 Maneuver	1149	-	-	1008	-	-	100	180	526
Stage 1	-	-	-	-	-	-	257	365	-
Stage 2	-	-	-	-	-	-	466	606	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1149	-	-	1008	-	-	70	154	526
Mov Cap-2 Maneuver	-	-	-	-	-	-	70	154	-
Stage 1	-	-	-	-	-	-	223	317	-
Stage 2	-	-	-	-	-	-	373	599	-

Approach	EB	WB	NB
HCM Control Delay, s	2	0.3	36.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	132	1149	-	-	1008	-	-	477
HCM Lane V/C Ratio	0.129	0.133	-	-	0.011	-	-	0.283
HCM Control Delay (s)	36.3	8.6	-	-	8.6	-	-	15.5
HCM Lane LOS	E	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0.5	-	-	0	-	-	1.2

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	5	10	104
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	88	88	88
Heavy Vehicles, %	2	2	25
Mvmt Flow	6	11	118

Major/Minor	Minor2		
Conflicting Flow All	1167	1164	319
Stage 1	341	341	-
Stage 2	826	823	-
Critical Hdwy	7.12	6.52	6.45
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.525
Pot Cap-1 Maneuver	171	194	671
Stage 1	674	639	-
Stage 2	366	388	-
Platoon blocked, %			
Mov Cap-1 Maneuver	147	166	671
Mov Cap-2 Maneuver	147	166	-
Stage 1	585	632	-
Stage 2	309	337	-

Approach	SB
HCM Control Delay, s	15.5
HCM LOS	C

Minor Lane/Major Mvmt

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	5	69	29	0	90	69	5	0	29	5	110
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	91	83	2	2	91	2	2	83	2	5
Mvmt Flow	0	6	78	33	0	102	78	6	0	32	5	121
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.3	9.2	10.5
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	5%	55%	33%
Vol Thru, %	3%	67%	42%	33%
Vol Right, %	76%	28%	3%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	144	103	164	15
LT Vol	5	69	69	5
Through Vol	110	29	5	5
RT Vol	29	5	90	5
Lane Flow Rate	158	117	186	17
Geometry Grp	1	1	1	1
Degree of Util (X)	0.247	0.146	0.241	0.022
Departure Headway (Hd)	5.617	4.498	4.663	4.74
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	639	797	770	752
Service Time	3.657	2.528	2.689	2.79
HCM Lane V/C Ratio	0.247	0.147	0.242	0.023
HCM Control Delay	10.5	8.3	9.2	7.9
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1	0.5	0.9	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	5	5	5
Peak Hour Factor	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	6	6	6
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.9
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	169	10	30	159	5	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	38	30	2	41	2	10
Mvmt Flow	192	11	34	181	6	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	203	0	447	198
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	249	-
Critical Hdwy	-	-	4.12	-	6.42	6.3
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.39
Pot Cap-1 Maneuver	-	-	1369	-	569	823
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	792	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1369	-	553	823
Mov Cap-2 Maneuver	-	-	-	-	553	-
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	770	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	769	-	-	1369	-
HCM Lane V/C Ratio	0.052	-	-	0.025	-
HCM Control Delay (s)	9.9	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	99	90	20	120	100	30	10	131	120	20	171	89
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	1159	1752	1900	1827	1816	1900	1863	1766	1900	1863	1513	1900
Adj Flow Rate, veh/h	112	102	23	136	114	34	11	149	136	23	194	101
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	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, %	64	7	7	4	3	3	2	9	9	2	4	4
Cap, veh/h	136	180	41	234	190	57	31	198	181	60	234	122
Arrive On Green	0.12	0.13	0.13	0.13	0.14	0.14	0.02	0.23	0.23	0.03	0.25	0.25
Sat Flow, veh/h	1103	1384	312	1740	1345	401	1774	852	777	1774	938	489
Grp Volume(v), veh/h	112	0	125	136	0	148	11	0	285	23	0	295
Grp Sat Flow(s),veh/h/ln	1103	0	1697	1740	0	1746	1774	0	1629	1774	0	1427
Q Serve(g_s), s	4.1	0.0	2.8	3.0	0.0	3.3	0.3	0.0	6.7	0.5	0.0	8.0
Cycle Q Clear(g_c), s	4.1	0.0	2.8	3.0	0.0	3.3	0.3	0.0	6.7	0.5	0.0	8.0
Prop In Lane	1.00		0.18	1.00		0.23	1.00		0.48	1.00		0.34
Lane Grp Cap(c), veh/h	136	0	220	234	0	247	31	0	379	60	0	355
V/C Ratio(X)	0.82	0.00	0.57	0.58	0.00	0.60	0.36	0.00	0.75	0.38	0.00	0.83
Avail Cap(c_a), veh/h	540	0	1244	851	0	1280	868	0	1593	868	0	1396
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	17.5	0.0	16.7	16.6	0.0	16.5	19.9	0.0	14.6	19.3	0.0	14.5
Incr Delay (d2), s/veh	4.7	0.0	0.9	0.8	0.0	0.9	2.6	0.0	1.1	1.5	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	1.4	0.0	1.4	1.5	0.0	1.6	0.1	0.0	3.0	0.3	0.0	3.3
LnGrp Delay(d),s/veh	22.2	0.0	17.6	17.5	0.0	17.4	22.5	0.0	15.8	20.8	0.0	16.5
LnGrp LOS	C		B	B		B	C		B	C		B
Approach Vol, veh/h		237			284			296			318	
Approach Delay, s/veh		19.7			17.4			16.0			16.8	
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	5.5	15.5	9.6	10.3	4.8	16.2	9.1	10.8
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	4.1	* 5
Max Green Setting (Gmax), s	20.0	40.0	20.0	* 30	20.0	40.0	20.0	* 30
Max Q Clear Time (g_c+I1), s	2.5	8.7	5.0	4.8	2.3	10.0	6.1	5.3
Green Ext Time (p_c), s	0.0	0.5	0.0	0.4	0.0	0.5	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	17.4
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	108	167	40	197	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	91	91	91	88	88	88
Heavy Vehicles, %	2	7	42	2	32	2	2	2	2
Mvmt Flow	0	114	176	44	216	0	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	216	0	0	289	0	0	507	506	202
Stage 1	-	-	-	-	-	-	202	202	-
Stage 2	-	-	-	-	-	-	305	304	-
Critical Hdwy	4.12	-	-	4.12	-	-	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	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1354	-	-	1273	-	-	476	469	839
Stage 1	-	-	-	-	-	-	800	734	-
Stage 2	-	-	-	-	-	-	705	663	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1354	-	-	1273	-	-	408	451	839
Mov Cap-2 Maneuver	-	-	-	-	-	-	408	451	-
Stage 1	-	-	-	-	-	-	800	734	-
Stage 2	-	-	-	-	-	-	598	637	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1354	-	-	1273	-	-	452	816
HCM Lane V/C Ratio	-	-	-	-	0.035	-	-	0.015	0.116
HCM Control Delay (s)	0	0	-	-	7.9	0	-	13.1	10
HCM Lane LOS	A	A	-	-	A	A	-	B	B
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0	0.4

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	5	1	83
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	25
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	88	88	88
Heavy Vehicles, %	2	2	5
Mvmt Flow	6	1	94

Major/Minor	Minor2		
Conflicting Flow All	506	593	216
Stage 1	304	304	-
Stage 2	202	289	-
Critical Hdwy	7.12	6.52	6.25
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.345
Pot Cap-1 Maneuver	477	418	816
Stage 1	705	663	-
Stage 2	800	673	-
Platoon blocked, %			
Mov Cap-1 Maneuver	463	402	816
Mov Cap-2 Maneuver	463	402	-
Stage 1	705	637	-
Stage 2	800	673	-

Approach	SB
HCM Control Delay, s	10.2
HCM LOS	B

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	60	53	0	90	5	147	1	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	3	13	2	2	2	41	2	2
Mvmt Flow	0	68	60	0	102	6	167	1	34

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	102	0	-	68	0	0	170	170	68
Stage 1	-	-	-	-	-	-	68	68	-
Stage 2	-	-	-	-	-	-	102	102	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.81	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.81	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.81	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.869	4.018	3.318
Pot Cap-1 Maneuver	1490	-	0	1533	-	0	738	723	995
Stage 1	-	-	0	-	-	0	865	838	-
Stage 2	-	-	0	-	-	0	833	811	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1490	-	-	1533	-	-	738	0	995
Mov Cap-2 Maneuver	-	-	-	-	-	-	738	0	-
Stage 1	-	-	-	-	-	-	865	0	-
Stage 2	-	-	-	-	-	-	833	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	772	1490	-	1533	-
HCM Lane V/C Ratio	0.262	-	-	-	-
HCM Control Delay (s)	11.3	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	1.1	0	-	0	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	0
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	88	88	88
Heavy Vehicles, %	2	2	2
Mvmt Flow	0	0	0

Major/Minor	
Conflicting Flow All	
Stage 1	
Stage 2	
Critical Hdwy	
Critical Hdwy Stg 1	
Critical Hdwy Stg 2	
Follow-up Hdwy	
Pot Cap-1 Maneuver	
Stage 1	
Stage 2	
Platoon blocked, %	
Mov Cap-1 Maneuver	
Mov Cap-2 Maneuver	
Stage 1	
Stage 2	

Approach	
HCM Control Delay, s	
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	335	320	0	735	156	0	0	0	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	90	90	90	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	40	2	2
Mvmt Flow	0	381	364	0	817	173	0	0	0	6	0	6

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	817	0	0	744	0	0	1380	1561	817
Stage 1	-	-	-	-	-	-	817	817	-
Stage 2	-	-	-	-	-	-	563	744	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.8	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.86	4.018	3.318
Pot Cap-1 Maneuver	811	-	-	864	-	0	132	112	376
Stage 1	-	-	-	-	-	0	375	390	-
Stage 2	-	-	-	-	-	0	502	421	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	811	-	-	864	-	-	132	0	376
Mov Cap-2 Maneuver	-	-	-	-	-	-	132	0	-
Stage 1	-	-	-	-	-	-	375	0	-
Stage 2	-	-	-	-	-	-	502	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	811	-	-	864	-	132	376
HCM Lane V/C Ratio	-	-	-	-	-	0.043	0.015
HCM Control Delay (s)	0	-	-	0	-	33.5	14.7
HCM Lane LOS	A	-	-	A	-	D	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.1	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	320	20	0	541	20	350	0	241	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	1854	1900	0	1863	1863	1900	1863	1845			
Adj Flow Rate, veh/h	0	352	0	0	569	21	385	0	265			
Adj No. of Lanes	0	1	0	0	1	1	0	1	1			
Peak Hour Factor	0.91	0.91	0.91	0.95	0.95	0.95	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	2	3	2	3			
Cap, veh/h	0	721	0	0	724	615	492	0	434			
Arrive On Green	0.00	0.39	0.00	0.00	0.39	0.39	0.28	0.00	0.28			
Sat Flow, veh/h	0	1854	0	0	1863	1583	1774	0	1568			
Grp Volume(v), veh/h	0	352	0	0	569	21	385	0	265			
Grp Sat Flow(s),veh/h/ln	0	1854	0	0	1863	1583	1774	0	1568			
Q Serve(g_s), s	0.0	4.1	0.0	0.0	7.7	0.2	5.8	0.0	4.2			
Cycle Q Clear(g_c), s	0.0	4.1	0.0	0.0	7.7	0.2	5.8	0.0	4.2			
Prop In Lane	0.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	721	0	0	724	615	492	0	434			
V/C Ratio(X)	0.00	0.49	0.00	0.00	0.79	0.03	0.78	0.00	0.61			
Avail Cap(c_a), veh/h	0	2583	0	0	2595	2206	927	0	819			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	6.6	0.0	0.0	7.7	5.4	9.6	0.0	9.0			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.7	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			
%ile BackOfQ(50%),veh/ln	0.0	2.1	0.0	0.0	3.9	0.1	2.9	0.0	1.8			
LnGrp Delay(d),s/veh	0.0	6.8	0.0	0.0	8.5	5.4	10.6	0.0	9.5			
LnGrp LOS		A			A	A	B		A			
Approach Vol, veh/h		352			590			650				
Approach Delay, s/veh		6.8			8.3			10.2				
Approach LOS		A			A			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		16.7				16.7		12.1
Change Period (Y+Rc), s		5.5				5.5		4.1
Max Green Setting (Gmax), s		40.0				40.0		15.0
Max Q Clear Time (g_c+I1), s		6.1				9.7		7.8
Green Ext Time (p_c), s		1.4				1.4		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		8.8
HCM 2010 LOS		A

Intersection	
Int Delay, s/veh	33

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	501	110	20	531	5	140	10	10	5	5	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	88	88	88	88	88	88
Heavy Vehicles, %	30	2	4	10	2	2	6	2	2	2	20	2
Mvmt Flow	11	569	125	21	559	5	159	11	11	6	6	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	564	0	0	694	0	0	1273	1261	632	1270	1321	562
Stage 1	-	-	-	-	-	-	655	655	-	604	604	-
Stage 2	-	-	-	-	-	-	618	606	-	666	717	-
Critical Hdwy	4.4	-	-	4.2	-	-	7.16	6.52	6.22	7.12	6.7	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.12	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.12	5.7	-
Follow-up Hdwy	2.47	-	-	2.29	-	-	3.554	4.018	3.318	3.518	4.18	3.318
Pot Cap-1 Maneuver	882	-	-	865	-	-	~ 141	170	480	145	144	526
Stage 1	-	-	-	-	-	-	448	463	-	485	460	-
Stage 2	-	-	-	-	-	-	470	487	-	449	408	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	882	-	-	865	-	-	~ 125	161	480	128	136	526
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 125	161	-	128	136	-
Stage 1	-	-	-	-	-	-	439	453	-	475	444	-
Stage 2	-	-	-	-	-	-	428	470	-	418	399	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	267.9	20.6
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	133	882	-	-	865	-	-	264
HCM Lane V/C Ratio	1.367	0.013	-	-	0.024	-	-	0.129
HCM Control Delay (s)	267.9	9.1	0	-	9.3	0	-	20.6
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	11.9	0	-	-	0.1	-	-	0.4

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	51	540	5	5	540	5	5	5	10	5	10	81
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	190	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	88	88	88	88	88	88
Heavy Vehicles, %	4	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	614	6	5	568	5	6	6	11	6	11	92

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	574	0	0	619	0	0	1365	1316	616	1323	1317	571
Stage 1	-	-	-	-	-	-	732	732	-	582	582	-
Stage 2	-	-	-	-	-	-	633	584	-	741	735	-
Critical Hdwy	4.14	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.236	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	989	-	-	961	-	-	125	158	491	133	157	520
Stage 1	-	-	-	-	-	-	413	427	-	499	499	-
Stage 2	-	-	-	-	-	-	468	498	-	408	425	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	989	-	-	961	-	-	92	148	491	120	147	520
Mov Cap-2 Maneuver	-	-	-	-	-	-	92	148	-	120	147	-
Stage 1	-	-	-	-	-	-	389	402	-	470	496	-
Stage 2	-	-	-	-	-	-	374	495	-	370	400	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	27.3	19.2
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	184	989	-	-	961	-	-	362
HCM Lane V/C Ratio	0.124	0.059	-	-	0.005	-	-	0.301
HCM Control Delay (s)	27.3	8.9	-	-	8.8	-	-	19.2
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0	-	-	1.2

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	5	8	6	0	80	8	5	0	6	5	50	0	5	5	5
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	38	17	2	2	38	2	2	17	2	2	2	2	2	2
Mvmt Flow	0	6	9	7	0	91	9	6	0	7	6	57	0	6	6	6
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.9	7.4	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	26%	86%	33%
Vol Thru, %	8%	42%	9%	33%
Vol Right, %	82%	32%	5%	33%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	61	19	93	15
LT Vol	5	8	8	5
Through Vol	50	6	5	5
RT Vol	6	5	80	5
Lane Flow Rate	69	22	106	17
Geometry Grp	1	1	1	1
Degree of Util (X)	0.076	0.024	0.124	0.019
Departure Headway (Hd)	3.95	4.029	4.241	4.075
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	896	880	842	866
Service Time	2.021	2.091	2.28	2.157
HCM Lane V/C Ratio	0.077	0.025	0.126	0.02
HCM Control Delay	7.4	7.2	7.9	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.4	0.1

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	63	5	30	103	5	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	2	2	3	2	2
Mvmt Flow	72	6	34	117	6	45

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	77	0	259	74
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	185	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1522	-	730	988
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	847	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1522	-	712	988
Mov Cap-2 Maneuver	-	-	-	-	712	-
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	947	-	-	1522	-
HCM Lane V/C Ratio	0.054	-	-	0.022	-
HCM Control Delay (s)	9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	33	70	20	120	80	40	20	190	110	20	130	43
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	1743	1863	1900	1863	1863	1900	1863	1843	1900	1727	1805	1900
Adj Flow Rate, veh/h	38	80	23	132	88	44	23	216	125	22	141	47
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.88	0.88	0.88	0.92	0.92	0.92
Percent Heavy Veh, %	9	2	2	2	2	2	2	2	2	10	4	4
Cap, veh/h	155	165	47	237	160	80	60	267	154	53	314	105
Arrive On Green	0.09	0.12	0.12	0.13	0.14	0.14	0.03	0.24	0.24	0.03	0.24	0.24
Sat Flow, veh/h	1660	1392	400	1774	1172	586	1774	1095	634	1645	1297	432
Grp Volume(v), veh/h	38	0	103	132	0	132	23	0	341	22	0	188
Grp Sat Flow(s),veh/h/ln	1660	0	1792	1774	0	1757	1774	0	1729	1645	0	1729
Q Serve(g_s), s	0.9	0.0	2.2	2.8	0.0	2.9	0.5	0.0	7.6	0.5	0.0	3.8
Cycle Q Clear(g_c), s	0.9	0.0	2.2	2.8	0.0	2.9	0.5	0.0	7.6	0.5	0.0	3.8
Prop In Lane	1.00		0.22	1.00		0.33	1.00		0.37	1.00		0.25
Lane Grp Cap(c), veh/h	155	0	212	237	0	240	60	0	421	53	0	419
V/C Ratio(X)	0.25	0.00	0.49	0.56	0.00	0.55	0.38	0.00	0.81	0.41	0.00	0.45
Avail Cap(c_a), veh/h	780	0	1323	873	0	1297	873	0	1702	809	0	1701
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	17.1	0.0	16.8	16.5	0.0	16.4	19.2	0.0	14.5	19.3	0.0	13.1
Incr Delay (d2), s/veh	0.3	0.0	0.6	0.8	0.0	0.7	1.5	0.0	1.4	1.9	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	0.4	0.0	1.1	1.4	0.0	1.4	0.3	0.0	3.8	0.3	0.0	1.8
LnGrp Delay(d),s/veh	17.4	0.0	17.4	17.3	0.0	17.1	20.7	0.0	15.9	21.2	0.0	13.4
LnGrp LOS	B		B	B		B	C		B	C		B
Approach Vol, veh/h		141			264			364			210	
Approach Delay, s/veh		17.4			17.2			16.2			14.2	
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	5.4	15.9	9.5	9.8	5.5	15.8	8.8	10.5
Change Period (Y+Rc), s	4.1	6.0	4.1	* 5	4.1	6.0	* 5	* 5
Max Green Setting (Gmax), s	20.3	40.0	20.0	* 30	20.0	40.0	* 19	* 30
Max Q Clear Time (g_c+I1), s	11.5	9.6	4.8	4.2	2.5	5.8	2.9	4.9
Green Ext Time (p_c), s	0.0	0.5	0.0	0.1	0.0	0.5	0.1	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Notes

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

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	140	103	40	153	0	0	0	0	5	4	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	5	5	7	2	2	2	2	2	75	3
Mvmt Flow	0	157	116	45	174	0	0	0	0	6	5	68

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	174	0	0	273	0	0	482	480	215	480	538	174
Stage 1	-	-	-	-	-	-	215	215	-	265	265	-
Stage 2	-	-	-	-	-	-	267	265	-	215	273	-
Critical Hdwy	4.12	-	-	4.15	-	-	7.12	6.52	6.22	7.12	7.25	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	6.25	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	6.25	-
Follow-up Hdwy	2.218	-	-	2.245	-	-	3.518	4.018	3.318	3.518	4.675	3.327
Pot Cap-1 Maneuver	1403	-	-	1273	-	-	495	485	825	496	362	867
Stage 1	-	-	-	-	-	-	787	725	-	740	575	-
Stage 2	-	-	-	-	-	-	738	689	-	787	569	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1403	-	-	1273	-	-	438	466	825	481	348	867
Mov Cap-2 Maneuver	-	-	-	-	-	-	438	466	-	481	348	-
Stage 1	-	-	-	-	-	-	787	725	-	740	553	-
Stage 2	-	-	-	-	-	-	648	662	-	787	569	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.6	0	10.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1403	-	-	1273	-	-	411	867
HCM Lane V/C Ratio	-	-	-	-	0.036	-	-	0.025	0.079
HCM Control Delay (s)	0	0	-	-	7.9	0	-	14	9.5
HCM Lane LOS	A	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0.1	0.3

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	70	75	0	80	5	113	0	50	0	0	0
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	3	2	2	2	2	2
Mvmt Flow	0	80	85	0	91	6	128	0	57	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	91	0	-	80	0	0	171	171	80
Stage 1	-	-	-	-	-	-	80	80	-
Stage 2	-	-	-	-	-	-	91	91	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.43	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.527	4.018	3.318
Pot Cap-1 Maneuver	1504	-	0	1518	-	0	817	722	980
Stage 1	-	-	0	-	-	0	941	828	-
Stage 2	-	-	0	-	-	0	930	820	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1504	-	-	1518	-	-	817	0	980
Mov Cap-2 Maneuver	-	-	-	-	-	-	817	0	-
Stage 1	-	-	-	-	-	-	941	0	-
Stage 2	-	-	-	-	-	-	930	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT
Capacity (veh/h)	861	1504	-	1518	-
HCM Lane V/C Ratio	0.215	-	-	-	-
HCM Control Delay (s)	10.3	0	-	0	-
HCM Lane LOS	B	A	-	A	-
HCM 95th %tile Q(veh)	0.8	0	-	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	20	549	100	5	339	5	100	10	10	5	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	20	7	2	2	15	2	3	30	2	20	60	2
Mvmt Flow	23	624	114	6	385	6	114	11	11	6	6	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	391	0	0	738	0	0	1134	1128	681	1137	1182	388
Stage 1	-	-	-	-	-	-	726	726	-	399	399	-
Stage 2	-	-	-	-	-	-	408	402	-	738	783	-
Critical Hdwy	4.3	-	-	4.12	-	-	7.13	6.8	6.22	7.3	7.1	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.8	-	6.3	6.1	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.8	-	6.3	6.1	-
Follow-up Hdwy	2.38	-	-	2.218	-	-	3.527	4.27	3.318	3.68	4.54	3.318
Pot Cap-1 Maneuver	1076	-	-	868	-	-	179	182	450	165	148	660
Stage 1	-	-	-	-	-	-	414	390	-	593	513	-
Stage 2	-	-	-	-	-	-	618	555	-	383	331	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1076	-	-	868	-	-	167	174	450	151	141	660
Mov Cap-2 Maneuver	-	-	-	-	-	-	341	324	-	303	276	-
Stage 1	-	-	-	-	-	-	399	376	-	571	508	-
Stage 2	-	-	-	-	-	-	595	550	-	349	319	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	22	14.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	346	1076	-	-	868	-	-	402
HCM Lane V/C Ratio	0.394	0.021	-	-	0.007	-	-	0.057
HCM Control Delay (s)	22	8.4	0	-	9.2	0	-	14.5
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.8	0.1	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	501	110	20	531	5	140	10	10	5	5	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	95	95	95	88	88	88	88	88	88
Heavy Vehicles, %	30	2	4	10	2	2	6	2	2	2	20	2
Mvmt Flow	11	569	125	21	559	5	159	11	11	6	6	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	564	0	0	694	0	0	1273	1261	632	1270	1321	562
Stage 1	-	-	-	-	-	-	655	655	-	604	604	-
Stage 2	-	-	-	-	-	-	618	606	-	666	717	-
Critical Hdwy	4.4	-	-	4.2	-	-	7.16	6.52	6.22	7.12	6.7	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.12	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.12	5.7	-
Follow-up Hdwy	2.47	-	-	2.29	-	-	3.554	4.018	3.318	3.518	4.18	3.318
Pot Cap-1 Maneuver	882	-	-	865	-	-	~ 141	170	480	145	144	526
Stage 1	-	-	-	-	-	-	448	463	-	485	460	-
Stage 2	-	-	-	-	-	-	470	487	-	449	408	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	882	-	-	865	-	-	~ 127	161	480	132	136	526
Mov Cap-2 Maneuver	-	-	-	-	-	-	311	339	-	313	300	-
Stage 1	-	-	-	-	-	-	439	453	-	475	444	-
Stage 2	-	-	-	-	-	-	428	470	-	418	399	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	30.1	14.2
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	320	882	-	-	865	-	-	425
HCM Lane V/C Ratio	0.568	0.013	-	-	0.024	-	-	0.08
HCM Control Delay (s)	30.1	9.1	0	-	9.3	0	-	14.2
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	3.3	0	-	-	0.1	-	-	0.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

APPENDIX C: ROADWAY SEGMENT LOS TECHNICAL CALCULATIONS



HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 96 - NB
From/To	SR-16 to County Road 20
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.61	
Shoulder width	5.5	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	18	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	66	veh/h
Opposing direction volume, Vo	59	veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.9	1.9
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.949	0.949
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	114 pc/h	102 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	41.9	mi/h
Percent Free Flow Speed, PFFS	95.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.994	0.994
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	109 pc/h	97 pc/h
Base percent time-spent-following,(note-4) BPTSFd	12.6 %	
Adjustment for no-passing zones, fnp	27.9	
Percent time-spent-following, PTSFd	27.4 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	27	veh-mi
Peak-hour vehicle-miles of travel, VMT60	66	veh-mi
Peak 15-min total travel time, TT15	0.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1690	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.9	mi/h
Percent time-spent-following, PTSFd (from above)	27.4	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	108.2
Effective width of outside lane, We	34.72
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-0.38
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 96 - SB
From/To	County Road 20 to SR-16
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.78	
Shoulder width	5.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	59	veh/h
Opposing direction volume, Vo	66	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	77	pc/h	86	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	42.3	mi/h
Percent Free Flow Speed, PFFS	96.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.998	0.998
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	76 pc/h	85 pc/h
Base percent time-spent-following,(note-4) BPTSFd	9.0 %	
Adjustment for no-passing zones, fnp	29.6	
Percent time-spent-following, PTSFd	23.0 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.04	
Peak 15-min vehicle-miles of travel, VMT15	19	veh-mi
Peak-hour vehicle-miles of travel, VMT60	59	veh-mi
Peak 15-min total travel time, TT15	0.4	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.3	mi/h
Percent time-spent-following, PTSFd (from above)	23.0	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	75.6
Effective width of outside lane, We	33.99
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-1.39
Bicycle LOS	A

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - EB
From/To	
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.69	
Shoulder width	4.0	ft	% Trucks and buses	36	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	15	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	11	veh/h
Opposing direction volume, Vo	9	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.755		0.755	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	21	pc/h	17	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	44.8	mi/h
Percent Free Flow Speed, PFFS	99.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	17 pc/h	14 pc/h
Base percent time-spent-following,(note-4) BPTSFd	2.2 %	
Adjustment for no-passing zones, fnp	24.9	
Percent time-spent-following, PTSFd	15.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	3	veh-mi
Peak-hour vehicle-miles of travel, VMT60	8	veh-mi
Peak 15-min total travel time, TT15	0.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1641	veh/h
Directional Capacity	1641	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.8	mi/h
Percent time-spent-following, PTSFd (from above)	15.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	15.9
Effective width of outside lane, We	31.12
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	18.12
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - WB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.45	
Shoulder width	4.0	ft	% Trucks and buses	22	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	17	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	9	veh/h
Opposing direction volume, Vo	11	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.835		0.835	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	24	pc/h	29	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	44.7	mi/h
Percent Free Flow Speed, PFFS	98.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.978	0.978
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	20 pc/h	25 pc/h
Base percent time-spent-following,(note-4) BPTSFd	2.5 %	
Adjustment for no-passing zones, fnp	26.9	
Percent time-spent-following, PTSFd	14.5 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	4	veh-mi
Peak-hour vehicle-miles of travel, VMT60	6	veh-mi
Peak 15-min total travel time, TT15	0.1	veh-h
Capacity from ATS, CdATS	1420	veh/h
Capacity from PTSF, CdPTSF	1663	veh/h
Directional Capacity	1663	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.7	mi/h
Percent time-spent-following, PTSFd (from above)	14.5	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	20.0
Effective width of outside lane, We	31.28
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	7.42
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - EB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.78	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	39	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	408	veh/h
Opposing direction volume, Vo	216	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	525	pc/h	279	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSd	44.3	mi/h
Percent Free Flow Speed, PFFS	84.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.998
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	523 pc/h	277 pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.7 %	
Adjustment for no-passing zones, fnp	30.5	
Percent time-spent-following, PTSFd	68.6 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.31	
Peak 15-min vehicle-miles of travel, VMT15	588	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1836	veh-mi
Peak 15-min total travel time, TT15	13.3	veh-h
Capacity from ATS, CdATS	1686	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	1686	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.3	mi/h
Percent time-spent-following, PTSFd (from above)	68.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	523.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.53
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - WB
From/To	County Rd 96 to County Rd 94B
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	40	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	262	veh/h
Opposing direction volume, Vo	437	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.980		0.990	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	291	pc/h	480	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	44.6	mi/h
Percent Free Flow Speed, PFFS	85.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.995	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	286 pc/h	475 pc/h
Base percent time-spent-following,(note-4) BPTSFd	34.9 %	
Adjustment for no-passing zones, fnp	34.1	
Percent time-spent-following, PTSFd	47.7 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.17	
Peak 15-min vehicle-miles of travel, VMT15	121	veh-mi
Peak-hour vehicle-miles of travel, VMT60	445	veh-mi
Peak 15-min total travel time, TT15	2.7	veh-h
Capacity from ATS, CdATS	1683	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.6	mi/h
Percent time-spent-following, PTSFd (from above)	47.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	284.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.04
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - NB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	34	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	167	veh/h
Opposing direction volume, Vo	200	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.954		0.962	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	184	pc/h	219	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSd	47.7	mi/h
Percent Free Flow Speed, PFFS	90.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.992	0.992
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	177 pc/h	212 pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.1 %	
Adjustment for no-passing zones, fnp	46.2	
Percent time-spent-following, PTSFd	40.1 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.11	
Peak 15-min vehicle-miles of travel, VMT15	79	veh-mi
Peak-hour vehicle-miles of travel, VMT60	301	veh-mi
Peak 15-min total travel time, TT15	1.7	veh-h
Capacity from ATS, CdATS	1635	veh/h
Capacity from PTSF, CdPTSF	1687	veh/h
Directional Capacity	1635	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	47.7	mi/h
Percent time-spent-following, PTSFd (from above)	40.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	175.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.79
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - SB
From/To	I-5 to County Road 20
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	30	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	200	veh/h
Opposing direction volume, Vo	167	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.980		0.980	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	249	pc/h	208	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSd	47.4	mi/h
Percent Free Flow Speed, PFFS	89.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.996	0.996
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	245 pc/h	204 pc/h
Base percent time-spent-following,(note-4) BPTSFd	25.5 %	
Adjustment for no-passing zones, fnp	43.8	
Percent time-spent-following, PTSFd	49.4 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.15	
Peak 15-min vehicle-miles of travel, VMT15	110	veh-mi
Peak-hour vehicle-miles of travel, VMT60	360	veh-mi
Peak 15-min total travel time, TT15	2.3	veh-h
Capacity from ATS, CdATS	1666	veh/h
Capacity from PTSF, CdPTSF	1693	veh/h
Directional Capacity	1666	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	47.4	mi/h
Percent time-spent-following, PTSFd (from above)	49.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	243.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.67
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 96 - NB
From/To	SR-16 to County Road 20
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	5.5	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	18	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	45	veh/h
Opposing direction volume, Vo	89	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	56	pc/h	111	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.2	mi/h
Average travel speed, ATSd	42.2	mi/h
Percent Free Flow Speed, PFFS	96.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	56 pc/h	111 pc/h
Base percent time-spent-following,(note-4) BPTSFd	6.8 %	
Adjustment for no-passing zones, fnp	27.1	
Percent time-spent-following, PTSFd	15.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.03	
Peak 15-min vehicle-miles of travel, VMT15	14	veh-mi
Peak-hour vehicle-miles of travel, VMT60	45	veh-mi
Peak 15-min total travel time, TT15	0.3	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.2	mi/h
Percent time-spent-following, PTSFd (from above)	15.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	56.3
Effective width of outside lane, We	36.56
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-2.88
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - EB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.50	
Shoulder width	4.0	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	15	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	4	veh/h
Opposing direction volume, Vo	4	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	8	pc/h	8	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	45.0	mi/h
Percent Free Flow Speed, PFFS	99.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	8 pc/h	8 pc/h
Base percent time-spent-following,(note-4) BPTSFd	1.1 %	
Adjustment for no-passing zones, fnp	24.2	
Percent time-spent-following, PTSFd	13.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.00	
Peak 15-min vehicle-miles of travel, VMT15	1	veh-mi
Peak-hour vehicle-miles of travel, VMT60	3	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	45.0	mi/h
Percent time-spent-following, PTSFd (from above)	13.2	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	8.0
Effective width of outside lane, We	31.68
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-2.20
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.80	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	39	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	400	veh/h
Opposing direction volume, Vo	481	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	502	pc/h	602	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSd	42.9	mi/h
Percent Free Flow Speed, PFFS	81.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	500 pc/h	601 pc/h
Base percent time-spent-following,(note-4) BPTSFd	52.1 %	
Adjustment for no-passing zones, fnp	29.8	
Percent time-spent-following, PTSFd	65.6 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.30	
Peak 15-min vehicle-miles of travel, VMT15	562	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1800	veh-mi
Peak 15-min total travel time, TT15	13.1	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.9	mi/h
Percent time-spent-following, PTSFd (from above)	65.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	500.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.51
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - WB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	37	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	481	veh/h
Opposing direction volume, Vo	400	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	507	pc/h	422	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	43.7	mi/h
Percent Free Flow Speed, PFFS	83.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	506 pc/h	421 pc/h
Base percent time-spent-following,(note-4) BPTSFd	50.0 %	
Adjustment for no-passing zones, fnp	33.4	
Percent time-spent-following, PTSFd	68.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.30	
Peak 15-min vehicle-miles of travel, VMT15	570	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2165	veh-mi
Peak 15-min total travel time, TT15	13.0	veh-h
Capacity from ATS, CdATS	1695	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1695	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	43.7	mi/h
Percent time-spent-following, PTSFd (from above)	68.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	506.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.29
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	County Rd 94B to County Rd 96
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.83	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	35	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	477	veh/h
Opposing direction volume, Vo	534	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	575	pc/h	644	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSd	41.7	mi/h
Percent Free Flow Speed, PFFS	80.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	575 pc/h	643 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.7 %	
Adjustment for no-passing zones, fnp	26.8	
Percent time-spent-following, PTSFd	70.4 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.34	
Peak 15-min vehicle-miles of travel, VMT15	244	veh-mi
Peak-hour vehicle-miles of travel, VMT60	811	veh-mi
Peak 15-min total travel time, TT15	5.9	veh-h
Capacity from ATS, CdATS	1698	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1698	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.7	mi/h
Percent time-spent-following, PTSFd (from above)	70.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	574.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.35
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - WB
From/To	County Rd 94B to County Rd 96
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	40	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	534	veh/h
Opposing direction volume, Vo	477	veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.999	0.998
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	563 pc/h	503 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	42.4	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	562 pc/h	502 pc/h
Base percent time-spent-following,(note-4) BPTSFd	55.7 %	
Adjustment for no-passing zones, fnp	31.8	
Percent time-spent-following, PTSFd	72.5 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.33	
Peak 15-min vehicle-miles of travel, VMT15	239	veh-mi
Peak-hour vehicle-miles of travel, VMT60	908	veh-mi
Peak 15-min total travel time, TT15	5.6	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.4	mi/h
Percent time-spent-following, PTSFd (from above)	72.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	562.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.34
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	34	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	203	veh/h
Opposing direction volume, Vo	184	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.995		0.995	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	229	pc/h	208	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSd	47.4	mi/h
Percent Free Flow Speed, PFFS	89.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.999	0.999
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	228 pc/h	207 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.9 %	
Adjustment for no-passing zones, fnp	47.5	
Percent time-spent-following, PTSFd	48.8 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.13	
Peak 15-min vehicle-miles of travel, VMT15	103	veh-mi
Peak-hour vehicle-miles of travel, VMT60	365	veh-mi
Peak 15-min total travel time, TT15	2.2	veh-h
Capacity from ATS, CdATS	1692	veh/h
Capacity from PTSF, CdPTSF	1698	veh/h
Directional Capacity	1692	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	47.4	mi/h
Percent time-spent-following, PTSFd (from above)	48.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	228.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	1.88
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - WB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	2014
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	30	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	184	veh/h
Opposing direction volume, Vo	203	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.976		0.976	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	209	pc/h	231	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	47.6	mi/h
Percent Free Flow Speed, PFFS	90.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.995	0.995
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	205 pc/h	227 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.6 %	
Adjustment for no-passing zones, fnp	45.3	
Percent time-spent-following, PTSFd	44.1 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.12	
Peak 15-min vehicle-miles of travel, VMT15	92	veh-mi
Peak-hour vehicle-miles of travel, VMT60	331	veh-mi
Peak 15-min total travel time, TT15	1.9	veh-h
Capacity from ATS, CdATS	1659	veh/h
Capacity from PTSF, CdPTSF	1692	veh/h
Directional Capacity	1659	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	47.6	mi/h
Percent time-spent-following, PTSFd (from above)	44.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	204.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.87
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 96 - NB
From/To	SR-16 to County Road 20
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.61	
Shoulder width	5.5	ft	% Trucks and buses	25	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	18	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	81	veh/h
Opposing direction volume, Vo	74	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.833		0.833	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	159	pc/h	146	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.5	mi/h
Average travel speed, ATSd	40.9	mi/h
Percent Free Flow Speed, PFFS	93.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.976	0.976
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	136 pc/h	124 pc/h
Base percent time-spent-following,(note-4) BPTSFd	15.4 %	
Adjustment for no-passing zones, fnp	30.5	
Percent time-spent-following, PTSFd	31.4 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.08	
Peak 15-min vehicle-miles of travel, VMT15	33	veh-mi
Peak-hour vehicle-miles of travel, VMT60	81	veh-mi
Peak 15-min total travel time, TT15	0.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1659	veh/h
Directional Capacity	1659	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.9	mi/h
Percent time-spent-following, PTSFd (from above)	31.4	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	132.8
Effective width of outside lane, We	33.41
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	9.67
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 96 - SB
From/To	County Road 20 to SR-16
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.78	
Shoulder width	5.0	ft	% Trucks and buses	23	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	74	veh/h
Opposing direction volume, Vo	81	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.829		0.829	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	114	pc/h	125	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.3	mi/h
Average travel speed, ATSd	41.5	mi/h
Percent Free Flow Speed, PFFS	95.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.978	0.978
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	97 pc/h	106 pc/h
Base percent time-spent-following,(note-4) BPTSFd	11.3 %	
Adjustment for no-passing zones, fnp	29.7	
Percent time-spent-following, PTSFd	25.5 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	24	veh-mi
Peak-hour vehicle-miles of travel, VMT60	74	veh-mi
Peak 15-min total travel time, TT15	0.6	veh-h
Capacity from ATS, CdATS	1409	veh/h
Capacity from PTSF, CdPTSF	1662	veh/h
Directional Capacity	1662	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.5	mi/h
Percent time-spent-following, PTSFd (from above)	25.5	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	94.9
Effective width of outside lane, We	32.71
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	8.40
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - EB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.69	
Shoulder width	4.0	ft	% Trucks and buses	95	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	15	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	62	veh/h
Opposing direction volume, Vo	60	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.539		0.539	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	167	pc/h	161	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	42.1	mi/h
Percent Free Flow Speed, PFFS	93.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.913		0.913	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	98	pc/h	95	pc/h
Base percent time-spent-following,(note-4) BPTSFd	11.4	%		
Adjustment for no-passing zones, fnp	24.3			
Percent time-spent-following, PTSFd	23.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	16	veh-mi
Peak-hour vehicle-miles of travel, VMT60	43	veh-mi
Peak 15-min total travel time, TT15	0.4	veh-h
Capacity from ATS, CdATS	916	veh/h
Capacity from PTSF, CdPTSF	1553	veh/h
Directional Capacity	1553	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.1	mi/h
Percent time-spent-following, PTSFd (from above)	23.7	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	89.9
Effective width of outside lane, We	27.04
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	108.39
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - WB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.45	
Shoulder width	4.0	ft	% Trucks and buses	95	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	17	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	60	veh/h
Opposing direction volume, Vo	62	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.568		0.601	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	235	pc/h	229	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	40.7	mi/h
Percent Free Flow Speed, PFFS	90.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.913	0.913
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	146 pc/h	151 pc/h
Base percent time-spent-following,(note-4) BPTSFd	16.4 %	
Adjustment for no-passing zones, fnp	31.4	
Percent time-spent-following, PTSFd	31.8 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.09	
Peak 15-min vehicle-miles of travel, VMT15	23	veh-mi
Peak-hour vehicle-miles of travel, VMT60	42	veh-mi
Peak 15-min total travel time, TT15	0.6	veh-h
Capacity from ATS, CdATS	1022	veh/h
Capacity from PTSF, CdPTSF	1553	veh/h
Directional Capacity	1553	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.7	mi/h
Percent time-spent-following, PTSFd (from above)	31.8	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	133.3
Effective width of outside lane, We	27.20
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	108.55
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - EB
From/To	County Rd 96 to County Rd 98
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	6.0	ft	% Trucks and buses	34	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	24	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	138	veh/h
Opposing direction volume, Vo	126	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.831		0.808	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	208	pc/h	195	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	42.0	mi/h
Percent Free Flow Speed, PFFS	90.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.967	0.967
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	178 pc/h	163 pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.5 %	
Adjustment for no-passing zones, fnp	39.3	
Percent time-spent-following, PTSFd	40.0 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	86	veh-mi
Peak-hour vehicle-miles of travel, VMT60	276	veh-mi
Peak 15-min total travel time, TT15	2.0	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1644	veh/h
Directional Capacity	1644	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.0	mi/h
Percent time-spent-following, PTSFd (from above)	40.0	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	172.5
Effective width of outside lane, We	29.58
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	18.02
Bicycle LOS	F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - WB
From/To	County Rd 98 to County Rd 96
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.63	
Shoulder width	6.0	ft	% Trucks and buses	33	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	22	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	126	veh/h
Opposing direction volume, Vo	138	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.858		0.858	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	233	pc/h	255	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSd	41.4	mi/h
Percent Free Flow Speed, PFFS	89.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.968	0.968
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	207 pc/h	226 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.8 %	
Adjustment for no-passing zones, fnp	40.7	
Percent time-spent-following, PTSFd	42.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.12	
Peak 15-min vehicle-miles of travel, VMT15	100	veh-mi
Peak-hour vehicle-miles of travel, VMT60	252	veh-mi
Peak 15-min total travel time, TT15	2.4	veh-h
Capacity from ATS, CdATS	1459	veh/h
Capacity from PTSF, CdPTSF	1646	veh/h
Directional Capacity	1646	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.4	mi/h
Percent time-spent-following, PTSFd (from above)	42.3	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	200.0
Effective width of outside lane, We	30.66
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	16.91
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - EB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.78	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	39	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	422	veh/h
Opposing direction volume, Vo	230	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	548	pc/h	302	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSd	44.0	mi/h
Percent Free Flow Speed, PFFS	83.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.994
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	541 pc/h	297 pc/h
Base percent time-spent-following,(note-4) BPTSFd	50.7 %	
Adjustment for no-passing zones, fnp	30.1	
Percent time-spent-following, PTSFd	70.1 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.32	
Peak 15-min vehicle-miles of travel, VMT15	609	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1899	veh-mi
Peak 15-min total travel time, TT15	13.9	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.0	mi/h
Percent time-spent-following, PTSFd (from above)	70.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	541.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.68
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - WB
From/To	County Road 94B to I-505
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.76	
Shoulder width	6.0	ft	% Trucks and buses	14	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	37	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	230	veh/h
Opposing direction volume, Vo	422	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.947		0.986	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	320	pc/h	563	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	44.6	mi/h
Percent Free Flow Speed, PFFS	84.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.986	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	307 pc/h	555 pc/h
Base percent time-spent-following,(note-4) BPTSFd	38.4 %	
Adjustment for no-passing zones, fnp	29.2	
Percent time-spent-following, PTSFd	48.8 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.19	
Peak 15-min vehicle-miles of travel, VMT15	340	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1035	veh-mi
Peak 15-min total travel time, TT15	7.6	veh-h
Capacity from ATS, CdATS	1676	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1676	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.6	mi/h
Percent time-spent-following, PTSFd (from above)	48.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	302.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	6.62
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - EB
From/To	County Rd 94B to County Rd 96
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.87	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	35	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	451	veh/h
Opposing direction volume, Vo	276	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	525	pc/h	325	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	43.7	mi/h
Percent Free Flow Speed, PFFS	84.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.994
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	518 pc/h	319 pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.8 %	
Adjustment for no-passing zones, fnp	30.4	
Percent time-spent-following, PTSFd	68.6 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.31	
Peak 15-min vehicle-miles of travel, VMT15	220	veh-mi
Peak-hour vehicle-miles of travel, VMT60	767	veh-mi
Peak 15-min total travel time, TT15	5.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	43.7	mi/h
Percent time-spent-following, PTSFd (from above)	68.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	518.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.65
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - WB
From/To	County Rd 96 to County Rd 94B
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	11	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	40	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	276	veh/h
Opposing direction volume, Vo	451	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.958		0.978	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	313	pc/h	501	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	44.3	mi/h
Percent Free Flow Speed, PFFS	85.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.989	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	303 pc/h	490 pc/h
Base percent time-spent-following,(note-4) BPTSFd	36.8 %	
Adjustment for no-passing zones, fnp	32.7	
Percent time-spent-following, PTSFd	49.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.18	
Peak 15-min vehicle-miles of travel, VMT15	128	veh-mi
Peak-hour vehicle-miles of travel, VMT60	469	veh-mi
Peak 15-min total travel time, TT15	2.9	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1663	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.3	mi/h
Percent time-spent-following, PTSFd (from above)	49.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	300.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	5.25
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - EB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	26	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	34	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	202	veh/h
Opposing direction volume, Vo	235	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.885		0.885	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	240	pc/h	280	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSd	46.9	mi/h
Percent Free Flow Speed, PFFS	88.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.975		0.975	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	218	pc/h	254	pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.5	%		
Adjustment for no-passing zones, fnp	46.0			
Percent time-spent-following, PTSFd	45.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.14	
Peak 15-min vehicle-miles of travel, VMT15	96	veh-mi
Peak-hour vehicle-miles of travel, VMT60	364	veh-mi
Peak 15-min total travel time, TT15	2.0	veh-h
Capacity from ATS, CdATS	1540	veh/h
Capacity from PTSF, CdPTSF	1657	veh/h
Directional Capacity	1540	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	46.9	mi/h
Percent time-spent-following, PTSFd (from above)	45.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	212.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	13.79
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - WB
From/To	I-5 to County Road 20
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	20	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	30	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	235	veh/h
Opposing direction volume, Vo	202	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.926		0.909	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	309	pc/h	271	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	46.6	mi/h
Percent Free Flow Speed, PFFS	88.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.980	0.980
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	292 pc/h	251 pc/h
Base percent time-spent-following,(note-4) BPTSFd	31.1 %	
Adjustment for no-passing zones, fnp	42.9	
Percent time-spent-following, PTSFd	54.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.18	
Peak 15-min vehicle-miles of travel, VMT15	129	veh-mi
Peak-hour vehicle-miles of travel, VMT60	423	veh-mi
Peak 15-min total travel time, TT15	2.8	veh-h
Capacity from ATS, CdATS	1574	veh/h
Capacity from PTSF, CdPTSF	1667	veh/h
Directional Capacity	1574	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	46.6	mi/h
Percent time-spent-following, PTSFd (from above)	54.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	286.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	9.89
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 96 - NB
From/To	SR-16 to County Road 20
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	5.5	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	18	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	46	veh/h
Opposing direction volume, Vo	90	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	59	pc/h	115	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.2	mi/h
Average travel speed, ATSd	42.1	mi/h
Percent Free Flow Speed, PFFS	96.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.998	0.998
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	58 pc/h	113 pc/h
Base percent time-spent-following,(note-4) BPTSFd	7.0 %	
Adjustment for no-passing zones, fnp	27.2	
Percent time-spent-following, PTSFd	16.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.03	
Peak 15-min vehicle-miles of travel, VMT15	14	veh-mi
Peak-hour vehicle-miles of travel, VMT60	46	veh-mi
Peak 15-min total travel time, TT15	0.3	veh-h
Capacity from ATS, CdATS	1673	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.1	mi/h
Percent time-spent-following, PTSFd (from above)	16.2	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	57.5
Effective width of outside lane, We	36.47
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-2.40
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 96 - SB
From/To	County Road 20 to SR-16
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.67	
Shoulder width	5.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	90	veh/h
Opposing direction volume, Vo	46	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.991	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	135	pc/h	69	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	42.0	mi/h
Percent Free Flow Speed, PFFS	96.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.999		0.999	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	134	pc/h	69	pc/h
Base percent time-spent-following,(note-4) BPTSFd	15.2	%		
Adjustment for no-passing zones, fnp	29.1			
Percent time-spent-following, PTSFd	34.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.08	
Peak 15-min vehicle-miles of travel, VMT15	34	veh-mi
Peak-hour vehicle-miles of travel, VMT60	90	veh-mi
Peak 15-min total travel time, TT15	0.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1698	veh/h
Directional Capacity	1698	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.0	mi/h
Percent time-spent-following, PTSFd (from above)	34.4	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	134.3
Effective width of outside lane, We	31.35
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-0.46
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - EB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.50	
Shoulder width	4.0	ft	% Trucks and buses	33	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	15	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	6	veh/h
Opposing direction volume, Vo	6	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.771		0.771	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	16	pc/h	16	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	44.8	mi/h
Percent Free Flow Speed, PFFS	99.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.968		0.968	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	12	pc/h	12	pc/h
Base percent time-spent-following,(note-4) BPTSFd	1.6	%		
Adjustment for no-passing zones, fnp	24.2			
Percent time-spent-following, PTSFd	13.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	2	veh-mi
Peak-hour vehicle-miles of travel, VMT60	4	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1311	veh/h
Capacity from PTSF, CdPTSF	1646	veh/h
Directional Capacity	1646	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.8	mi/h
Percent time-spent-following, PTSFd (from above)	13.7	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	12.0
Effective width of outside lane, We	31.52
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	15.22
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - WB
From/To	County Road 96 to Plant
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.50	
Shoulder width	4.0	ft	% Trucks and buses	33	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	17	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	6	veh/h
Opposing direction volume, Vo	6	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.771		0.771	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	16	pc/h	16	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	44.8	mi/h
Percent Free Flow Speed, PFFS	99.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.968		0.968	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	12	pc/h	12	pc/h
Base percent time-spent-following,(note-4) BPTSFd	1.6	%		
Adjustment for no-passing zones, fnp	26.2			
Percent time-spent-following, PTSFd	14.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	2	veh-mi
Peak-hour vehicle-miles of travel, VMT60	4	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1311	veh/h
Capacity from PTSF, CdPTSF	1646	veh/h
Directional Capacity	1646	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.8	mi/h
Percent time-spent-following, PTSFd (from above)	14.7	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	12.0
Effective width of outside lane, We	31.52
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	15.22
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - EB
From/To	County Rd 96 to County Rd 98
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.75	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	24	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	97	veh/h
Opposing direction volume, Vo	118	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.984		0.986	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	131	pc/h	160	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSd	43.2	mi/h
Percent Free Flow Speed, PFFS	93.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.998	0.998
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	130 pc/h	158 pc/h
Base percent time-spent-following,(note-4) BPTSFd	14.8 %	
Adjustment for no-passing zones, fnp	36.1	
Percent time-spent-following, PTSFd	31.1 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.08	
Peak 15-min vehicle-miles of travel, VMT15	65	veh-mi
Peak-hour vehicle-miles of travel, VMT60	194	veh-mi
Peak 15-min total travel time, TT15	1.5	veh-h
Capacity from ATS, CdATS	1676	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	43.2	mi/h
Percent time-spent-following, PTSFd (from above)	31.1	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	129.3
Effective width of outside lane, We	33.27
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-0.88
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - WB
From/To	County Rd 98 to County Rd 96
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	22	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	118	veh/h
Opposing direction volume, Vo	97	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.984		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	135	pc/h	111	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	0.3	mi/h
Average travel speed, ATSd	44.1	mi/h
Percent Free Flow Speed, PFFS	95.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.998	0.998
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	133 pc/h	109 pc/h
Base percent time-spent-following,(note-4) BPTSFd	15.1 %	
Adjustment for no-passing zones, fnp	32.9	
Percent time-spent-following, PTSFd	33.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.08	
Peak 15-min vehicle-miles of travel, VMT15	66	veh-mi
Peak-hour vehicle-miles of travel, VMT60	236	veh-mi
Peak 15-min total travel time, TT15	1.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.1	mi/h
Percent time-spent-following, PTSFd (from above)	33.2	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	132.6
Effective width of outside lane, We	31.38
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-0.26
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.80	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	39	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	401	veh/h
Opposing direction volume, Vo	482	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	503	pc/h	604	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSd	42.9	mi/h
Percent Free Flow Speed, PFFS	81.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	501 pc/h	602 pc/h
Base percent time-spent-following,(note-4) BPTSFd	52.1 %	
Adjustment for no-passing zones, fnp	29.8	
Percent time-spent-following, PTSFd	65.6 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.30	
Peak 15-min vehicle-miles of travel, VMT15	564	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1805	veh-mi
Peak 15-min total travel time, TT15	13.1	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.9	mi/h
Percent time-spent-following, PTSFd (from above)	65.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	501.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.51
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - WB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	37	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	482	veh/h
Opposing direction volume, Vo	401	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	508	pc/h	423	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	43.7	mi/h
Percent Free Flow Speed, PFFS	83.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	507 pc/h	422 pc/h
Base percent time-spent-following,(note-4) BPTSFd	50.1 %	
Adjustment for no-passing zones, fnp	33.3	
Percent time-spent-following, PTSFd	68.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.30	
Peak 15-min vehicle-miles of travel, VMT15	571	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2169	veh-mi
Peak 15-min total travel time, TT15	13.1	veh-h
Capacity from ATS, CdATS	1695	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1695	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	43.7	mi/h
Percent time-spent-following, PTSFd (from above)	68.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	507.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.29
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	County Rd 94B to County Rd 96
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.83	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	35	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	478	veh/h
Opposing direction volume, Vo	535	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	577	pc/h	646	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSd	41.7	mi/h
Percent Free Flow Speed, PFFS	80.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	576 pc/h	645 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.8 %	
Adjustment for no-passing zones, fnp	26.7	
Percent time-spent-following, PTSFd	70.4 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.34	
Peak 15-min vehicle-miles of travel, VMT15	245	veh-mi
Peak-hour vehicle-miles of travel, VMT60	813	veh-mi
Peak 15-min total travel time, TT15	5.9	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.7	mi/h
Percent time-spent-following, PTSFd (from above)	70.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	575.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.58
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - WB
From/To	County Rd 94B to County Rd 96
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	40	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	535	veh/h
Opposing direction volume, Vo	478	veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.999	0.998
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	564 pc/h	504 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	42.4	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	563 pc/h	503 pc/h
Base percent time-spent-following,(note-4) BPTSFd	55.8 %	
Adjustment for no-passing zones, fnp	31.7	
Percent time-spent-following, PTSFd	72.5 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.33	
Peak 15-min vehicle-miles of travel, VMT15	239	veh-mi
Peak-hour vehicle-miles of travel, VMT60	910	veh-mi
Peak 15-min total travel time, TT15	5.6	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.4	mi/h
Percent time-spent-following, PTSFd (from above)	72.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	563.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.34
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	34	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	204	veh/h
Opposing direction volume, Vo	185	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.995		0.995	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	230	pc/h	209	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSd	47.4	mi/h
Percent Free Flow Speed, PFFS	89.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.999	0.999
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	229 pc/h	208 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.0 %	
Adjustment for no-passing zones, fnp	47.5	
Percent time-spent-following, PTSFd	48.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.14	
Peak 15-min vehicle-miles of travel, VMT15	103	veh-mi
Peak-hour vehicle-miles of travel, VMT60	367	veh-mi
Peak 15-min total travel time, TT15	2.2	veh-h
Capacity from ATS, CdATS	1692	veh/h
Capacity from PTSF, CdPTSF	1698	veh/h
Directional Capacity	1692	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	47.4	mi/h
Percent time-spent-following, PTSFd (from above)	48.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	229.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	1.88
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - WB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	E+P (Scenario 1)
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	30	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	185	veh/h
Opposing direction volume, Vo	204	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.976		0.976	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	211	pc/h	232	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	47.6	mi/h
Percent Free Flow Speed, PFFS	90.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.995		0.995	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	207	pc/h	228	pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.8	%		
Adjustment for no-passing zones, fnp	45.2			
Percent time-spent-following, PTSFd	44.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.12	
Peak 15-min vehicle-miles of travel, VMT15	93	veh-mi
Peak-hour vehicle-miles of travel, VMT60	333	veh-mi
Peak 15-min total travel time, TT15	2.0	veh-h
Capacity from ATS, CdATS	1659	veh/h
Capacity from PTSF, CdPTSF	1692	veh/h
Directional Capacity	1659	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	47.6	mi/h
Percent time-spent-following, PTSFd (from above)	44.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	205.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.87
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 96 - NB
From/To	SR-16 to County Road 20
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.61	
Shoulder width	5.5	ft	% Trucks and buses	16	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	18	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	136	veh/h
Opposing direction volume, Vo	116	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.926		0.926	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	241	pc/h	205	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	39.3	mi/h
Percent Free Flow Speed, PFFS	90.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.984	0.984
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	227 pc/h	193 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.0 %	
Adjustment for no-passing zones, fnp	36.6	
Percent time-spent-following, PTSFd	43.8 %	

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.13	
Peak 15-min vehicle-miles of travel, VMT15	56	veh-mi
Peak-hour vehicle-miles of travel, VMT60	136	veh-mi
Peak 15-min total travel time, TT15	1.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1673	veh/h
Directional Capacity	1673	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	39.3	mi/h
Percent time-spent-following, PTSFd (from above)	43.8	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	223.0
Effective width of outside lane, We	28.60
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	6.03
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 96 - SB
From/To	County Road 20 to SR-16
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.78	
Shoulder width	5.0	ft	% Trucks and buses	16	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	116	veh/h
Opposing direction volume, Vo	136	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.899		0.912	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	165	pc/h	191	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSd	40.1	mi/h
Percent Free Flow Speed, PFFS	91.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.984	0.984
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	151 pc/h	177 pc/h
Base percent time-spent-following,(note-4) BPTSFd	16.9 %	
Adjustment for no-passing zones, fnp	35.7	
Percent time-spent-following, PTSFd	33.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.09	
Peak 15-min vehicle-miles of travel, VMT15	37	veh-mi
Peak-hour vehicle-miles of travel, VMT60	116	veh-mi
Peak 15-min total travel time, TT15	0.9	veh-h
Capacity from ATS, CdATS	1550	veh/h
Capacity from PTSF, CdPTSF	1673	veh/h
Directional Capacity	1673	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.1	mi/h
Percent time-spent-following, PTSFd (from above)	33.3	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	148.7
Effective width of outside lane, We	29.14
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	5.67
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - EB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.69	
Shoulder width	4.0	ft	% Trucks and buses	79	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	15	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	75	veh/h
Opposing direction volume, Vo	85	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.584		0.613	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	186	pc/h	201	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	41.3	mi/h
Percent Free Flow Speed, PFFS	91.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.927		0.927	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	117	pc/h	133	pc/h
Base percent time-spent-following,(note-4) BPTSFd	13.4	%		
Adjustment for no-passing zones, fnp	26.9			
Percent time-spent-following, PTSFd	26.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	19	veh-mi
Peak-hour vehicle-miles of travel, VMT60	52	veh-mi
Peak 15-min total travel time, TT15	0.5	veh-h
Capacity from ATS, CdATS	1042	veh/h
Capacity from PTSF, CdPTSF	1576	veh/h
Directional Capacity	1576	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.3	mi/h
Percent time-spent-following, PTSFd (from above)	26.0	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	108.7
Effective width of outside lane, We	26.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	78.00
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - WB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.45	
Shoulder width	4.0	ft	% Trucks and buses	69	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	17	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	85	veh/h
Opposing direction volume, Vo	75	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.743		0.707	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	254	pc/h	236	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	40.5	mi/h
Percent Free Flow Speed, PFFS	89.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.935	0.935
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	202 pc/h	178 pc/h
Base percent time-spent-following,(note-4) BPTSFd	21.7 %	
Adjustment for no-passing zones, fnp	35.0	
Percent time-spent-following, PTSFd	40.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.12	
Peak 15-min vehicle-miles of travel, VMT15	33	veh-mi
Peak-hour vehicle-miles of travel, VMT60	59	veh-mi
Peak 15-min total travel time, TT15	0.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1590	veh/h
Directional Capacity	1590	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.5	mi/h
Percent time-spent-following, PTSFd (from above)	40.3	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	188.9
Effective width of outside lane, We	25.20
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	61.84
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - EB
From/To	County Rd 96 to County Rd 98
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	6.0	ft	% Trucks and buses	28	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	24	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	189	veh/h
Opposing direction volume, Vo	179	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.877		0.877	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	269	pc/h	255	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	41.1	mi/h
Percent Free Flow Speed, PFFS	88.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.973	0.973
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	243 pc/h	230 pc/h
Base percent time-spent-following,(note-4) BPTSFd	26.0 %	
Adjustment for no-passing zones, fnp	41.8	
Percent time-spent-following, PTSFd	47.5 %	

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.14	
Peak 15-min vehicle-miles of travel, VMT15	118	veh-mi
Peak-hour vehicle-miles of travel, VMT60	378	veh-mi
Peak 15-min total travel time, TT15	2.9	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1654	veh/h
Directional Capacity	1654	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.1	mi/h
Percent time-spent-following, PTSFd (from above)	47.5	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	236.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	14.82
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - WB
From/To	County Rd 98 to County Rd 96
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.63	
Shoulder width	6.0	ft	% Trucks and buses	24	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	22	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	179	veh/h
Opposing direction volume, Vo	189	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.912		0.912	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	312	pc/h	329	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSd	40.3	mi/h
Percent Free Flow Speed, PFFS	87.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	291 pc/h	307 pc/h
Base percent time-spent-following,(note-4) BPTSFd	32.0 %	
Adjustment for no-passing zones, fnp	39.0	
Percent time-spent-following, PTSFd	51.0 %	

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.17	
Peak 15-min vehicle-miles of travel, VMT15	142	veh-mi
Peak-hour vehicle-miles of travel, VMT60	358	veh-mi
Peak 15-min total travel time, TT15	3.5	veh-h
Capacity from ATS, CdATS	1550	veh/h
Capacity from PTSF, CdPTSF	1660	veh/h
Directional Capacity	1660	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.3	mi/h
Percent time-spent-following, PTSFd (from above)	51.0	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	284.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	12.08
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - EB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	39	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	659	veh/h
Opposing direction volume, Vo	439	veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.995	0.990
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	753 pc/h	504 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	41.4	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	749 pc/h	499 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.0 %	
Adjustment for no-passing zones, fnp	24.8	
Percent time-spent-following, PTSFd	78.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.44	
Peak 15-min vehicle-miles of travel, VMT15	842	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2966	veh-mi
Peak 15-min total travel time, TT15	20.3	veh-h
Capacity from ATS, CdATS	1683	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.4	mi/h
Percent time-spent-following, PTSFd (from above)	78.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	748.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.53
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - WB
From/To	County Road 94B to I-505
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	10	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	37	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	439	veh/h
Opposing direction volume, Vo	659	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.980		0.990	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	509	pc/h	756	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	42.0	mi/h
Percent Free Flow Speed, PFFS	80.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	499 pc/h	749 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.4 %	
Adjustment for no-passing zones, fnp	24.4	
Percent time-spent-following, PTSFd	64.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.30	
Peak 15-min vehicle-miles of travel, VMT15	561	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1976	veh-mi
Peak 15-min total travel time, TT15	13.4	veh-h
Capacity from ATS, CdATS	1683	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.0	mi/h
Percent time-spent-following, PTSFd (from above)	64.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	498.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	5.09
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - EB
From/To	County Rd 94B to County Rd 96
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	35	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	584	veh/h
Opposing direction volume, Vo	384	veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.995	0.985
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	667 pc/h	443 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	41.9	mi/h
Percent Free Flow Speed, PFFS	80.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	664 pc/h	436 pc/h
Base percent time-spent-following,(note-4) BPTSFd	59.6 %	
Adjustment for no-passing zones, fnp	26.5	
Percent time-spent-following, PTSFd	75.6 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.39	
Peak 15-min vehicle-miles of travel, VMT15	282	veh-mi
Peak-hour vehicle-miles of travel, VMT60	993	veh-mi
Peak 15-min total travel time, TT15	6.7	veh-h
Capacity from ATS, CdATS	1675	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1675	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.9	mi/h
Percent time-spent-following, PTSFd (from above)	75.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	663.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.47
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - WB
From/To	County Rd 96 to County Rd 94B
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	11	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	40	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	384	veh/h
Opposing direction volume, Vo	584	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.968		0.989	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	431	pc/h	642	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	42.8	mi/h
Percent Free Flow Speed, PFFS	82.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	417 pc/h	635 pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.4 %	
Adjustment for no-passing zones, fnp	28.5	
Percent time-spent-following, PTSFd	58.7 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.25	
Peak 15-min vehicle-miles of travel, VMT15	177	veh-mi
Peak-hour vehicle-miles of travel, VMT60	653	veh-mi
Peak 15-min total travel time, TT15	4.1	veh-h
Capacity from ATS, CdATS	1681	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1681	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.8	mi/h
Percent time-spent-following, PTSFd (from above)	58.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	417.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	5.42
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - NB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	23	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	34	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	257	veh/h
Opposing direction volume, Vo	262	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.916		0.916	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	295	pc/h	301	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSd	46.3	mi/h
Percent Free Flow Speed, PFFS	87.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.978	0.978
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	277 pc/h	282 pc/h
Base percent time-spent-following,(note-4) BPTSFd	30.2 %	
Adjustment for no-passing zones, fnp	45.8	
Percent time-spent-following, PTSFd	52.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.17	
Peak 15-min vehicle-miles of travel, VMT15	122	veh-mi
Peak-hour vehicle-miles of travel, VMT60	463	veh-mi
Peak 15-min total travel time, TT15	2.6	veh-h
Capacity from ATS, CdATS	1557	veh/h
Capacity from PTSF, CdPTSF	1662	veh/h
Directional Capacity	1557	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	46.3	mi/h
Percent time-spent-following, PTSFd (from above)	52.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	270.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	11.79
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - SB
From/To	I-5 to County Road 20
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	19	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	30	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	262	veh/h
Opposing direction volume, Vo	257	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.929		0.929	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	320	pc/h	314	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	46.2	mi/h
Percent Free Flow Speed, PFFS	87.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.981	0.981
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	303 pc/h	298 pc/h
Base percent time-spent-following,(note-4) BPTSFd	33.3 %	
Adjustment for no-passing zones, fnp	42.8	
Percent time-spent-following, PTSFd	54.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.19	
Peak 15-min vehicle-miles of travel, VMT15	134	veh-mi
Peak-hour vehicle-miles of travel, VMT60	472	veh-mi
Peak 15-min total travel time, TT15	2.9	veh-h
Capacity from ATS, CdATS	1579	veh/h
Capacity from PTSF, CdPTSF	1668	veh/h
Directional Capacity	1579	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	46.2	mi/h
Percent time-spent-following, PTSFd (from above)	54.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	297.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	9.31
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 96 - NB
From/To	SR-16 to County Road 20
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	5.5	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	18	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	61	veh/h
Opposing direction volume, Vo	111	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.986	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	78	pc/h	141	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSd	41.6	mi/h
Percent Free Flow Speed, PFFS	95.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.998	0.998
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	76 pc/h	139 pc/h
Base percent time-spent-following,(note-4) BPTSFd	9.0 %	
Adjustment for no-passing zones, fnp	27.9	
Percent time-spent-following, PTSFd	18.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.04	
Peak 15-min vehicle-miles of travel, VMT15	19	veh-mi
Peak-hour vehicle-miles of travel, VMT60	61	veh-mi
Peak 15-min total travel time, TT15	0.5	veh-h
Capacity from ATS, CdATS	1676	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.6	mi/h
Percent time-spent-following, PTSFd (from above)	18.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	76.3
Effective width of outside lane, We	35.16
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-1.80
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 96 - SB
From/To	County Road 20 to SR-16
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.67	
Shoulder width	5.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	111	veh/h
Opposing direction volume, Vo	61	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.991	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	167	pc/h	92	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	41.6	mi/h
Percent Free Flow Speed, PFFS	95.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.999	0.999
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	166 pc/h	91 pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.3 %	
Adjustment for no-passing zones, fnp	30.6	
Percent time-spent-following, PTSFd	38.1 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	41	veh-mi
Peak-hour vehicle-miles of travel, VMT60	111	veh-mi
Peak 15-min total travel time, TT15	1.0	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1698	veh/h
Directional Capacity	1698	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.6	mi/h
Percent time-spent-following, PTSFd (from above)	38.1	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	165.7
Effective width of outside lane, We	29.57
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	0.19
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - EB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.50	
Shoulder width	4.0	ft	% Trucks and buses	12	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	15	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	17	veh/h
Opposing direction volume, Vo	12	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.903		0.903	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	38	pc/h	27	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	44.6	mi/h
Percent Free Flow Speed, PFFS	98.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.988	0.988
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	34 pc/h	24 pc/h
Base percent time-spent-following,(note-4) BPTSFd	4.2 %	
Adjustment for no-passing zones, fnp	25.5	
Percent time-spent-following, PTSFd	19.1 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.02	
Peak 15-min vehicle-miles of travel, VMT15	6	veh-mi
Peak-hour vehicle-miles of travel, VMT60	12	veh-mi
Peak 15-min total travel time, TT15	0.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1680	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.6	mi/h
Percent time-spent-following, PTSFd (from above)	19.1	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	34.0
Effective width of outside lane, We	30.64
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	2.59
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - WB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.50	
Shoulder width	4.0	ft	% Trucks and buses	17	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	17	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	12	veh/h
Opposing direction volume, Vo	17	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.867		0.867	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	28	pc/h	39	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	44.6	mi/h
Percent Free Flow Speed, PFFS	98.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.983		0.983	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	24	pc/h	35	pc/h
Base percent time-spent-following,(note-4) BPTSFd	3.0	%		
Adjustment for no-passing zones, fnp	27.5			
Percent time-spent-following, PTSFd	14.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	4	veh-mi
Peak-hour vehicle-miles of travel, VMT60	8	veh-mi
Peak 15-min total travel time, TT15	0.1	veh-h
Capacity from ATS, CdATS	1474	veh/h
Capacity from PTSF, CdPTSF	1672	veh/h
Directional Capacity	1672	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.6	mi/h
Percent time-spent-following, PTSFd (from above)	14.2	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	24.0
Effective width of outside lane, We	31.04
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.69
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - EB
From/To	County Rd 96 to County Rd 98
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	24	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	121	veh/h
Opposing direction volume, Vo	141	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.986		0.986	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	139	pc/h	163	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSd	43.1	mi/h
Percent Free Flow Speed, PFFS	93.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.998		0.998	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	138	pc/h	161	pc/h
Base percent time-spent-following,(note-4) BPTSFd	15.6	%		
Adjustment for no-passing zones, fnp	36.8			
Percent time-spent-following, PTSFd	32.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.08	
Peak 15-min vehicle-miles of travel, VMT15	69	veh-mi
Peak-hour vehicle-miles of travel, VMT60	242	veh-mi
Peak 15-min total travel time, TT15	1.6	veh-h
Capacity from ATS, CdATS	1676	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	43.1	mi/h
Percent time-spent-following, PTSFd (from above)	32.6	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	137.5
Effective width of outside lane, We	31.11
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-0.15
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - WB
From/To	County Rd 98 to County Rd 96
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	22	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	141	veh/h
Opposing direction volume, Vo	121	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.993		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	160	pc/h	137	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	0.5	mi/h
Average travel speed, ATSd	43.5	mi/h
Percent Free Flow Speed, PFFS	94.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.999	0.999
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	159 pc/h	136 pc/h
Base percent time-spent-following,(note-4) BPTSFd	17.6 %	
Adjustment for no-passing zones, fnp	35.4	
Percent time-spent-following, PTSFd	36.7 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.09	
Peak 15-min vehicle-miles of travel, VMT15	79	veh-mi
Peak-hour vehicle-miles of travel, VMT60	282	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1698	veh/h
Directional Capacity	1698	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	43.5	mi/h
Percent time-spent-following, PTSFd (from above)	36.7	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	158.4
Effective width of outside lane, We	29.31
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	0.24
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	39	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	621	veh/h
Opposing direction volume, Vo	691	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	707	pc/h	787	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	40.2	mi/h
Percent Free Flow Speed, PFFS	76.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	706	pc/h	785	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.3	%		
Adjustment for no-passing zones, fnp	22.0			
Percent time-spent-following, PTSFd	75.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.42	
Peak 15-min vehicle-miles of travel, VMT15	794	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2795	veh-mi
Peak 15-min total travel time, TT15	19.7	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.2	mi/h
Percent time-spent-following, PTSFd (from above)	75.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	705.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.68
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - WB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	37	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	691	veh/h
Opposing direction volume, Vo	621	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	729	pc/h	655	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	40.9	mi/h
Percent Free Flow Speed, PFFS	77.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	727 pc/h	654 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.7 %	
Adjustment for no-passing zones, fnp	23.3	
Percent time-spent-following, PTSFd	77.0 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.43	
Peak 15-min vehicle-miles of travel, VMT15	818	veh-mi
Peak-hour vehicle-miles of travel, VMT60	3110	veh-mi
Peak 15-min total travel time, TT15	20.0	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.9	mi/h
Percent time-spent-following, PTSFd (from above)	77.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	727.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.70
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	County Rd 94B to County Rd 96
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	35	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	596	veh/h
Opposing direction volume, Vo	626	veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.998	0.998
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	679 pc/h	713 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	40.5	mi/h
Percent Free Flow Speed, PFFS	77.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	677 pc/h	711 pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.7 %	
Adjustment for no-passing zones, fnp	23.0	
Percent time-spent-following, PTSFd	74.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.40	
Peak 15-min vehicle-miles of travel, VMT15	288	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1013	veh-mi
Peak 15-min total travel time, TT15	7.1	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.5	mi/h
Percent time-spent-following, PTSFd (from above)	74.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	677.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.66
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - WB
From/To	County Rd 94B to County Rd 96
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	40	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	626	veh/h
Opposing direction volume, Vo	596	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	660	pc/h	628	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	41.1	mi/h
Percent Free Flow Speed, PFFS	79.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	659 pc/h	627 pc/h
Base percent time-spent-following,(note-4) BPTSFd	61.7 %	
Adjustment for no-passing zones, fnp	26.6	
Percent time-spent-following, PTSFd	75.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.39	
Peak 15-min vehicle-miles of travel, VMT15	280	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1064	veh-mi
Peak 15-min total travel time, TT15	6.8	veh-h
Capacity from ATS, CdATS	1698	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1698	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.1	mi/h
Percent time-spent-following, PTSFd (from above)	75.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	658.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.42
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	34	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	241	veh/h
Opposing direction volume, Vo	211	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.995	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	272	pc/h	238	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSd	46.9	mi/h
Percent Free Flow Speed, PFFS	88.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.999	0.999
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	271 pc/h	237 pc/h
Base percent time-spent-following,(note-4) BPTSFd	28.3 %	
Adjustment for no-passing zones, fnp	45.6	
Percent time-spent-following, PTSFd	52.6 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.16	
Peak 15-min vehicle-miles of travel, VMT15	122	veh-mi
Peak-hour vehicle-miles of travel, VMT60	434	veh-mi
Peak 15-min total travel time, TT15	2.6	veh-h
Capacity from ATS, CdATS	1692	veh/h
Capacity from PTSF, CdPTSF	1698	veh/h
Directional Capacity	1692	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	46.9	mi/h
Percent time-spent-following, PTSFd (from above)	52.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	270.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	1.97
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - SB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	Cumulative Baseline
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	30	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	211	veh/h
Opposing direction volume, Vo	241	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.976		0.980	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	240	pc/h	273	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	47.1	mi/h
Percent Free Flow Speed, PFFS	89.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.995	0.995
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	236 pc/h	269 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.1 %	
Adjustment for no-passing zones, fnp	43.6	
Percent time-spent-following, PTSFd	47.5 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.14	
Peak 15-min vehicle-miles of travel, VMT15	106	veh-mi
Peak-hour vehicle-miles of travel, VMT60	380	veh-mi
Peak 15-min total travel time, TT15	2.3	veh-h
Capacity from ATS, CdATS	1666	veh/h
Capacity from PTSF, CdPTSF	1692	veh/h
Directional Capacity	1666	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	47.1	mi/h
Percent time-spent-following, PTSFd (from above)	47.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	234.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.94
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 96 - NB
From/To	SR-16 to County Road 20
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.61	
Shoulder width	5.5	ft	% Trucks and buses		%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	18	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	149	veh/h
Opposing direction volume, Vo	129	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.976		0.976	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	250	pc/h	217	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	39.2	mi/h
Percent Free Flow Speed, PFFS	89.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.995	0.995
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	245 pc/h	213 pc/h
Base percent time-spent-following,(note-4) BPTSFd	26.8 %	
Adjustment for no-passing zones, fnp	36.5	
Percent time-spent-following, PTSFd	46.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.14	
Peak 15-min vehicle-miles of travel, VMT15	61	veh-mi
Peak-hour vehicle-miles of travel, VMT60	149	veh-mi
Peak 15-min total travel time, TT15	1.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1692	veh/h
Directional Capacity	1692	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	39.2	mi/h
Percent time-spent-following, PTSFd (from above)	46.3	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	244.3
Effective width of outside lane, We	27.46
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	1.99
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 96 - SB
From/To	County Road 20 to SR-16
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.78	
Shoulder width	5.0	ft	% Trucks and buses	14	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	129	veh/h
Opposing direction volume, Vo	149	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.923		0.935	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	179	pc/h	204	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	39.8	mi/h
Percent Free Flow Speed, PFFS	91.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.986	0.986
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	168 pc/h	194 pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.5 %	
Adjustment for no-passing zones, fnp	37.4	
Percent time-spent-following, PTSFd	35.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	41	veh-mi
Peak-hour vehicle-miles of travel, VMT60	129	veh-mi
Peak 15-min total travel time, TT15	1.0	veh-h
Capacity from ATS, CdATS	1590	veh/h
Capacity from PTSF, CdPTSF	1677	veh/h
Directional Capacity	1677	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	39.8	mi/h
Percent time-spent-following, PTSFd (from above)	35.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	165.4
Effective width of outside lane, We	28.03
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	5.06
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - EB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.69	
Shoulder width	4.0	ft	% Trucks and buses		%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	15	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	121	veh/h
Opposing direction volume, Vo	131	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.893		0.909	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	196	pc/h	209	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	41.1	mi/h
Percent Free Flow Speed, PFFS	91.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.980	0.980
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	179 pc/h	194 pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.6 %	
Adjustment for no-passing zones, fnp	32.7	
Percent time-spent-following, PTSFd	35.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	31	veh-mi
Peak-hour vehicle-miles of travel, VMT60	85	veh-mi
Peak 15-min total travel time, TT15	0.8	veh-h
Capacity from ATS, CdATS	1545	veh/h
Capacity from PTSF, CdPTSF	1667	veh/h
Directional Capacity	1667	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.1	mi/h
Percent time-spent-following, PTSFd (from above)	35.3	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	175.4
Effective width of outside lane, We	22.32
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	9.71
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - WB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.45	
Shoulder width	4.0	ft	% Trucks and buses		%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	17	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	131	veh/h
Opposing direction volume, Vo	121	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.951		0.951	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	306	pc/h	283	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	39.7	mi/h
Percent Free Flow Speed, PFFS	87.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.987		0.987	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	295	pc/h	272	pc/h
Base percent time-spent-following,(note-4) BPTSFd	32.2	%		
Adjustment for no-passing zones, fnp	34.9			
Percent time-spent-following, PTSFd	50.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.17	
Peak 15-min vehicle-miles of travel, VMT15	51	veh-mi
Peak-hour vehicle-miles of travel, VMT60	92	veh-mi
Peak 15-min total travel time, TT15	1.3	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1678	veh/h
Directional Capacity	1678	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	39.7	mi/h
Percent time-spent-following, PTSFd (from above)	50.4	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	291.1
Effective width of outside lane, We	21.52
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	6.50
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - EB
From/To	County Rd 96 to County Rd 98
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	6.0	ft	% Trucks and buses		%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	24	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	222	veh/h
Opposing direction volume, Vo	212	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.965		0.965	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	288	pc/h	275	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSd	40.8	mi/h
Percent Free Flow Speed, PFFS	88.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.991	0.991
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	280 pc/h	267 pc/h
Base percent time-spent-following,(note-4) BPTSFd	31.0 %	
Adjustment for no-passing zones, fnp	40.7	
Percent time-spent-following, PTSFd	51.8 %	

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.16	
Peak 15-min vehicle-miles of travel, VMT15	139	veh-mi
Peak-hour vehicle-miles of travel, VMT60	444	veh-mi
Peak 15-min total travel time, TT15	3.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1685	veh/h
Directional Capacity	1685	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.8	mi/h
Percent time-spent-following, PTSFd (from above)	51.8	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	277.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.27
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	County Road 20 - WB
From/To	County Rd 98 to County Rd 96
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.63	
Shoulder width	6.0	ft	% Trucks and buses	20	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	22	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	212	veh/h
Opposing direction volume, Vo	222	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.926		0.943	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	363	pc/h	374	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	39.6	mi/h
Percent Free Flow Speed, PFFS	85.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.980	0.980
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	343 pc/h	359 pc/h
Base percent time-spent-following,(note-4) BPTSFd	37.1 %	
Adjustment for no-passing zones, fnp	36.3	
Percent time-spent-following, PTSFd	54.8 %	

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.20	
Peak 15-min vehicle-miles of travel, VMT15	168	veh-mi
Peak-hour vehicle-miles of travel, VMT60	424	veh-mi
Peak 15-min total travel time, TT15	4.2	veh-h
Capacity from ATS, CdATS	1603	veh/h
Capacity from PTSF, CdPTSF	1667	veh/h
Directional Capacity	1667	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	39.6	mi/h
Percent time-spent-following, PTSFd (from above)	54.8	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	336.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	9.65
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - EB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	39	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	669	veh/h
Opposing direction volume, Vo	449	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.995		0.990	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	764	pc/h	515	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	41.3	mi/h
Percent Free Flow Speed, PFFS	78.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	760 pc/h	510 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.1 %	
Adjustment for no-passing zones, fnp	24.4	
Percent time-spent-following, PTSFd	79.7 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.45	
Peak 15-min vehicle-miles of travel, VMT15	855	veh-mi
Peak-hour vehicle-miles of travel, VMT60	3011	veh-mi
Peak 15-min total travel time, TT15	20.7	veh-h
Capacity from ATS, CdATS	1683	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.3	mi/h
Percent time-spent-following, PTSFd (from above)	79.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	760.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.54
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - WB
From/To	County Road 94B to I-505
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	9	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	37	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	449	veh/h
Opposing direction volume, Vo	669	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.991	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	520	pc/h	767	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	41.8	mi/h
Percent Free Flow Speed, PFFS	79.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	510 pc/h	760 pc/h
Base percent time-spent-following,(note-4) BPTSFd	55.5 %	
Adjustment for no-passing zones, fnp	24.0	
Percent time-spent-following, PTSFd	65.1 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.31	
Peak 15-min vehicle-miles of travel, VMT15	574	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2021	veh-mi
Peak 15-min total travel time, TT15	13.7	veh-h
Capacity from ATS, CdATS	1685	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1685	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.8	mi/h
Percent time-spent-following, PTSFd (from above)	65.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	510.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.71
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - EB
From/To	County Rd 94B to County Rd 96
Jurisdiction	Yolo County
Analysis Year	
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	35	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	594	veh/h
Opposing direction volume, Vo	394	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.995		0.985	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	678	pc/h	455	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	41.8	mi/h
Percent Free Flow Speed, PFFS	80.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	675	pc/h	448	pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.9	%		
Adjustment for no-passing zones, fnp	26.2			
Percent time-spent-following, PTSFd	76.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.40	
Peak 15-min vehicle-miles of travel, VMT15	287	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1010	veh-mi
Peak 15-min total travel time, TT15	6.9	veh-h
Capacity from ATS, CdATS	1675	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1675	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.8	mi/h
Percent time-spent-following, PTSFd (from above)	76.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	675.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.48
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - WB
From/To	County Rd 96 to County Rd 94B
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	10	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	40	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	394	veh/h
Opposing direction volume, Vo	594	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.990	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	441	pc/h	652	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	42.6	mi/h
Percent Free Flow Speed, PFFS	82.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	428 pc/h	646 pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.5 %	
Adjustment for no-passing zones, fnp	28.2	
Percent time-spent-following, PTSFd	59.7 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.26	
Peak 15-min vehicle-miles of travel, VMT15	182	veh-mi
Peak-hour vehicle-miles of travel, VMT60	670	veh-mi
Peak 15-min total travel time, TT15	4.3	veh-h
Capacity from ATS, CdATS	1683	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.6	mi/h
Percent time-spent-following, PTSFd (from above)	59.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	428.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	5.01
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - NB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	20	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	34	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	287	veh/h
Opposing direction volume, Vo	292	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.926		0.926	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	326	pc/h	332	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	45.9	mi/h
Percent Free Flow Speed, PFFS	87.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.980	0.980
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	308 pc/h	314 pc/h
Base percent time-spent-following,(note-4) BPTSFd	34.6 %	
Adjustment for no-passing zones, fnp	44.1	
Percent time-spent-following, PTSFd	56.4 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.19	
Peak 15-min vehicle-miles of travel, VMT15	136	veh-mi
Peak-hour vehicle-miles of travel, VMT60	517	veh-mi
Peak 15-min total travel time, TT15	3.0	veh-h
Capacity from ATS, CdATS	1574	veh/h
Capacity from PTSF, CdPTSF	1667	veh/h
Directional Capacity	1574	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	45.9	mi/h
Percent time-spent-following, PTSFd (from above)	56.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	302.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	9.92
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	AM Peak Hour
Highway	State Route 16 - SB
From/To	I-5 to County Road 20
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	16	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	30	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	292	veh/h
Opposing direction volume, Vo	287	veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.940	0.940
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	353 pc/h	347 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	45.7	mi/h
Percent Free Flow Speed, PFFS	86.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.984	0.984
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	337 pc/h	331 pc/h
Base percent time-spent-following,(note-4) BPTSFd	36.3 %	
Adjustment for no-passing zones, fnp	40.8	
Percent time-spent-following, PTSFd	56.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.21	
Peak 15-min vehicle-miles of travel, VMT15	149	veh-mi
Peak-hour vehicle-miles of travel, VMT60	526	veh-mi
Peak 15-min total travel time, TT15	3.3	veh-h
Capacity from ATS, CdATS	1598	veh/h
Capacity from PTSF, CdPTSF	1673	veh/h
Directional Capacity	1598	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	45.7	mi/h
Percent time-spent-following, PTSFd (from above)	56.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	331.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	7.69
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 96 - NB
From/To	SR-16 to County Road 20
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	5.5	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	18	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	61	veh/h
Opposing direction volume, Vo	111	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.986	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	78	pc/h	141	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSd	41.6	mi/h
Percent Free Flow Speed, PFFS	95.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.998	0.998
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	76 pc/h	139 pc/h
Base percent time-spent-following,(note-4) BPTSFd	9.0 %	
Adjustment for no-passing zones, fnp	27.9	
Percent time-spent-following, PTSFd	18.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.04	
Peak 15-min vehicle-miles of travel, VMT15	19	veh-mi
Peak-hour vehicle-miles of travel, VMT60	61	veh-mi
Peak 15-min total travel time, TT15	0.5	veh-h
Capacity from ATS, CdATS	1676	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.6	mi/h
Percent time-spent-following, PTSFd (from above)	18.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	76.3
Effective width of outside lane, We	35.16
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-1.80
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 96 - SB
From/To	County Road 20 to SR-16
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.67	
Shoulder width	5.0	ft	% Trucks and buses		%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	20	/mi

Analysis direction volume, Vd	111	veh/h
Opposing direction volume, Vo	61	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	166	pc/h	91	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	5.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	41.6	mi/h
Percent Free Flow Speed, PFFS	95.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	166 pc/h	91 pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.3 %	
Adjustment for no-passing zones, fnp	30.6	
Percent time-spent-following, PTSFd	38.1 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	41	veh-mi
Peak-hour vehicle-miles of travel, VMT60	111	veh-mi
Peak 15-min total travel time, TT15	1.0	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.6	mi/h
Percent time-spent-following, PTSFd (from above)	38.1	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	165.7
Effective width of outside lane, We	29.57
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-0.01
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - EB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.50	
Shoulder width	4.0	ft	% Trucks and buses	21	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	15	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	19	veh/h
Opposing direction volume, Vo	14	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.841		0.841	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	45	pc/h	33	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	44.5	mi/h
Percent Free Flow Speed, PFFS	98.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.979	0.979
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	39 pc/h	29 pc/h
Base percent time-spent-following,(note-4) BPTSFd	4.8 %	
Adjustment for no-passing zones, fnp	25.3	
Percent time-spent-following, PTSFd	19.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.02	
Peak 15-min vehicle-miles of travel, VMT15	7	veh-mi
Peak-hour vehicle-miles of travel, VMT60	13	veh-mi
Peak 15-min total travel time, TT15	0.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1665	veh/h
Directional Capacity	1665	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.5	mi/h
Percent time-spent-following, PTSFd (from above)	19.3	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	38.0
Effective width of outside lane, We	30.48
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	7.38
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - WB
From/To	West of County Road 96
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.50	
Shoulder width	4.0	ft	% Trucks and buses		%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	17	%
Up/down	-	%	Access point density	14	/mi

Analysis direction volume, Vd	14	veh/h
Opposing direction volume, Vo	19	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	28	pc/h	38	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	45.2	mi/h
Adjustment for no-passing zones, fnp	0.1	mi/h
Average travel speed, ATSd	44.6	mi/h
Percent Free Flow Speed, PFFS	98.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	28	pc/h	38	pc/h
Base percent time-spent-following,(note-4) BPTSFd	3.5	%		
Adjustment for no-passing zones, fnp	27.3			
Percent time-spent-following, PTSFd	15.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.02	
Peak 15-min vehicle-miles of travel, VMT15	5	veh-mi
Peak-hour vehicle-miles of travel, VMT60	10	veh-mi
Peak 15-min total travel time, TT15	0.1	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.6	mi/h
Percent time-spent-following, PTSFd (from above)	15.1	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	28.0
Effective width of outside lane, We	30.88
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	-1.31
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - EB
From/To	County Rd 96 to County Rd 98
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses		%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	24	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	123	veh/h
Opposing direction volume, Vo	143	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.979		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	143	pc/h	165	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSd	43.1	mi/h
Percent Free Flow Speed, PFFS	93.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.997	0.997
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	140 pc/h	163 pc/h
Base percent time-spent-following,(note-4) BPTSFd	15.8 %	
Adjustment for no-passing zones, fnp	37.0	
Percent time-spent-following, PTSFd	32.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.08	
Peak 15-min vehicle-miles of travel, VMT15	70	veh-mi
Peak-hour vehicle-miles of travel, VMT60	246	veh-mi
Peak 15-min total travel time, TT15	1.6	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1695	veh/h
Directional Capacity	1695	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	43.1	mi/h
Percent time-spent-following, PTSFd (from above)	32.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	139.8
Effective width of outside lane, We	30.93
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	0.15
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	County Road 20 - WB
From/To	County Rd 98 to County Rd 96
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	22	%
Up/down	-	%	Access point density	15	/mi

Analysis direction volume, Vd	143	veh/h
Opposing direction volume, Vo	123	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.979		0.979	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	164	pc/h	141	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.8	mi/h
Free-flow speed, FFSd	46.3	mi/h
Adjustment for no-passing zones, fnp	0.5	mi/h
Average travel speed, ATSd	43.4	mi/h
Percent Free Flow Speed, PFFS	93.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.997	0.997
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	161 pc/h	139 pc/h
Base percent time-spent-following,(note-4) BPTSFd	17.8 %	
Adjustment for no-passing zones, fnp	35.7	
Percent time-spent-following, PTSFd	37.0 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.09	
Peak 15-min vehicle-miles of travel, VMT15	80	veh-mi
Peak-hour vehicle-miles of travel, VMT60	286	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1695	veh/h
Directional Capacity	1695	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	43.4	mi/h
Percent time-spent-following, PTSFd (from above)	37.0	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	160.7
Effective width of outside lane, We	29.13
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	0.76
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	39	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	621	veh/h
Opposing direction volume, Vo	691	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	707	pc/h	787	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	40.2	mi/h
Percent Free Flow Speed, PFFS	76.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	706	pc/h	785	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.3	%		
Adjustment for no-passing zones, fnp	22.0			
Percent time-spent-following, PTSFd	75.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.42	
Peak 15-min vehicle-miles of travel, VMT15	794	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2795	veh-mi
Peak 15-min total travel time, TT15	19.7	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.2	mi/h
Percent time-spent-following, PTSFd (from above)	75.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	705.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.68
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - WB
From/To	I-505 to County Road 94B
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	4.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	37	%
Up/down	-	%	Access point density	10	/mi

Analysis direction volume, Vd	691	veh/h
Opposing direction volume, Vo	621	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	729	pc/h	655	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.5	mi/h
Free-flow speed, FFSd	52.5	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	40.9	mi/h
Percent Free Flow Speed, PFFS	77.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	727 pc/h	654 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.7 %	
Adjustment for no-passing zones, fnp	23.3	
Percent time-spent-following, PTSFd	77.0 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.43	
Peak 15-min vehicle-miles of travel, VMT15	818	veh-mi
Peak-hour vehicle-miles of travel, VMT60	3110	veh-mi
Peak 15-min total travel time, TT15	20.0	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	4.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.9	mi/h
Percent time-spent-following, PTSFd (from above)	77.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	727.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.70
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	County Rd 94B to County Rd 96
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	35	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	596	veh/h
Opposing direction volume, Vo	626	veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.998	0.998
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	679 pc/h	713 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	40.5	mi/h
Percent Free Flow Speed, PFFS	77.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	677 pc/h	711 pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.7 %	
Adjustment for no-passing zones, fnp	23.0	
Percent time-spent-following, PTSFd	74.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.40	
Peak 15-min vehicle-miles of travel, VMT15	288	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1013	veh-mi
Peak 15-min total travel time, TT15	7.1	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1697	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	40.5	mi/h
Percent time-spent-following, PTSFd (from above)	74.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	677.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.66
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.60

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - WB
From/To	County Rd 94B to County Rd 96
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.95	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	40	%
Up/down	-	%	Access point density	12	/mi

Analysis direction volume, Vd	626	veh/h
Opposing direction volume, Vo	596	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	660	pc/h	628	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.0	mi/h
Free-flow speed, FFSd	52.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	41.1	mi/h
Percent Free Flow Speed, PFFS	79.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	659 pc/h	627 pc/h
Base percent time-spent-following,(note-4) BPTSFd	61.7 %	
Adjustment for no-passing zones, fnp	26.6	
Percent time-spent-following, PTSFd	75.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.39	
Peak 15-min vehicle-miles of travel, VMT15	280	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1064	veh-mi
Peak 15-min total travel time, TT15	6.8	veh-h
Capacity from ATS, CdATS	1698	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1698	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.1	mi/h
Percent time-spent-following, PTSFd (from above)	75.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	658.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.42
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - EB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	34	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	243	veh/h
Opposing direction volume, Vo	213	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.990	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	275	pc/h	242	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSd	46.9	mi/h
Percent Free Flow Speed, PFFS	88.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.998	0.998
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	274 pc/h	240 pc/h
Base percent time-spent-following,(note-4) BPTSFd	30.0 %	
Adjustment for no-passing zones, fnp	45.5	
Percent time-spent-following, PTSFd	54.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.16	
Peak 15-min vehicle-miles of travel, VMT15	123	veh-mi
Peak-hour vehicle-miles of travel, VMT60	437	veh-mi
Peak 15-min total travel time, TT15	2.6	veh-h
Capacity from ATS, CdATS	1683	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	46.9	mi/h
Percent time-spent-following, PTSFd (from above)	54.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	273.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.20
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	M.H. & N.S.
Agency/Co.	Fehr & Peers
Date Performed	9/15/2014
Analysis Time Period	PM Peak Hour
Highway	State Route 16 - SB
From/To	County Road 20 to I-5
Jurisdiction	Yolo County
Analysis Year	C + P - Scenario 4
Description	Shifler Mining

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	30	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	213	veh/h
Opposing direction volume, Vo	243	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	244	pc/h	276	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	47.0	mi/h
Percent Free Flow Speed, PFFS	89.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.994	0.994
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	238 pc/h	272 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.1 %	
Adjustment for no-passing zones, fnp	43.6	
Percent time-spent-following, PTSFd	47.4 %	

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.14	
Peak 15-min vehicle-miles of travel, VMT15	107	veh-mi
Peak-hour vehicle-miles of travel, VMT60	383	veh-mi
Peak 15-min total travel time, TT15	2.3	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	47.0	mi/h
Percent time-spent-following, PTSFd (from above)	47.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	236.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.26
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

APPENDIX D: FREEWAY FACILITY LOS TECHNICAL CALCULATIONS



Project: **Shifler Mining and Reclamation** **Alternative:** **Existing Conditions**
Freeway Corridor: **Interstate 5 Northbound** **Time Period:** **AM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	2,200	1,500	1,250	1,250	1,500	2,250
Accel Length				200	330	
Decel Length		140				
Mainline Volume	628	628	522	522	550	552
On Ramp Volume				28	2	
Off Ramp Volume		106				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	628	628	522	550	552	552
PHF	0.85	0.85	0.85	0.85	0.85	0.85
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	31.2%	31.2%	31.2%	31.2%	31.2%	31.2%
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}	0.865	0.865	0.865	0.865	0.865	0.865
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	854	854	710	748	751	751
GP Flow (pcphpl)	427	427	355	374	375	375
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	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.18	0.18	0.15	0.16	0.16	0.16
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	6.1	6.1	5.1	5.3	5.4	5.4
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		854		711	748	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.18		0.15	0.16	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		728		748	751	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.15		0.16	0.16	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				28	2	
PHF				0.778	0.7	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				7.1%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.966	0.990	
f_P				1.00	1.00	
On Flow (pcph)				37	3	
On Flow (pcphpl)				37	3	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	25	
On Ramp Cap (pcph)				1,900	1,900	
On Ramp v/c ratio				0.02	0.00	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		106				
PHF		0.855				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		3.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.985				
f_P		1.00				
Off Flow (pcph)		126				
Off Flow (pcphpl)		126				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		25				
Off Ramp Cap (pcph)		1,900				
Off Ramp v/c ratio		0.07				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				711	748	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.583	0.587	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				711	748	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				711	748	
v_{R12a} (pcph)				748	751	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.2	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.2	
Merge v/c ratio				0.16	0.16	
Merge Density				10.0	9.3	
Merge LOS				B	A	

Location	1	2	3	4	5	6



Key

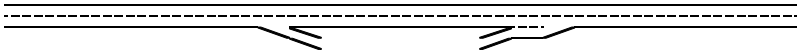
<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		854				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.733				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		854				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		854				
Diverge Speed Index		0.57				
Diverge Area Speed		54.1				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		54.1				
Diverge v/c ratio		0.19				
Diverge Density		10.3				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.18	0.19	0.15	0.16	0.16	0.16
Segment Density	6.1	10.3	5.1	10.0	9.3	5.4
Segment LOS	A	B	A	B	A	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **Existing Conditions**
Freeway Corridor: **Interstate 5 Southbound** **Time Period:** **AM Peak Hour**

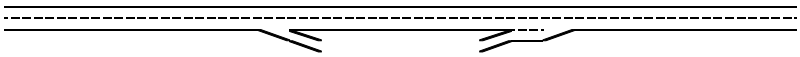
Location	1	2	3	4	5



Key
<> Express Lane (HOV)
No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Define Freeway Segment					
Type	Basic	Diverge	Basic	Merge	Basic
Length (ft)	3,000	1,500	2,160	1,500	2,500
Accel Length				260	
Decel Length		190			
Mainline Volume	615	615	543	543	666
On Ramp Volume				123	
Off Ramp Volume		72			
Express Lane Volume					
EL On Ramp Volume					
EL Off Ramp Volume					
Calculate Flow Rate in General Purpose Lanes (GP)					
GP Volume (vph)	615	615	543	666	666
PHF	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	21.6%	21.6%	21.6%	21.6%	21.6%
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}	0.903	0.903	0.903	0.903	0.903
f_P	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	754	754	666	816	816
GP Flow (pcphpl)	377	377	333	408	408
Calculate Speed in General Purpose Lanes					
Lane Width (ft)	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6
TRD	1.3	1.3	1.3	1.3	1.3
f_{LW}	0.0	0.0	0.0	0.0	0.0
f_{LC}	0.0	0.0	0.0	0.0	0.0
Calculated FFS	71.3	71.3	71.4	71.4	71.4
Measured FFS	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70
Calculate Operations in General Purpose Lanes					
v/c ratio	0.16	0.16	0.14	0.17	0.17
Speed (mph)	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	5.4	5.4	4.8	5.8	5.8
LOS	A	A	A	A	A
Calculate Operations for Entering GP Lanes					
GP_{IN} Vol (pcph)		754		670	
GP_{IN} Cap (pcph)		4,800		4,800	
GP_{IN} v/c ratio		0.16		0.14	
Calculate Operations for Exiting GP Lanes					
GP_{OUT} Vol (pcph)		649		816	
GP_{OUT} Cap (pcph)		4,800		4,800	
GP_{OUT} v/c ratio		0.14		0.17	

Location	1	2	3	4	5



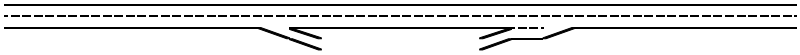
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate On Ramp Flow Rate					
On Volume (vph)				123	
PHF				0.863	
Total Lanes				1	
Terrain				Level	
Grade %				0.0%	
Grade Length (mi)				0.00	
Truck & Bus %				5.8%	
RV %				0.0%	
E_T				1.5	
E_R				1.2	
f_{HV}				0.972	
f_P				1.00	
On Flow (pcph)				147	
On Flow (pcphpl)				147	
Calculate On Ramp Roadway Operations					
On Ramp Type				Right	
On Ramp Speed (mph)				30	
On Ramp Cap (pcph)				1,900	
On Ramp v/c ratio				0.08	
Calculate Off Ramp Flow Rate					
Off Volume (vph)		72			
PHF		0.7			
Total Lanes		1			
Terrain		Level			
Grade %		0.0%			
Grade Length (mi)		0.00			
Truck & Bus %		3.8%			
RV %		0.0%			
E_T		1.5			
E_R		1.2			
f_{HV}		0.981			
f_P		1.00			
Off Flow (pcph)		105			
Off Flow (pcphpl)		105			
Calculate Off Ramp Roadway Operations					
Off Ramp Type		Right			
Off Ramp Speed		30			
Off Ramp Cap (pcph)		1,900			
Off Ramp v/c ratio		0.06			
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps					
Calculate Merge Influence Area Operations					
Effective v_P (pcph)				670	
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FM} (Eqn 13-3)				0.585	
P_{FM} (Eqn 13-4)					
P_{FM} (Eqn 13-5)					
P_{FM}				1.000	
v_{12} (pcph)				670	
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)				670	
v_{R12a} (pcph)				816	
Merge Speed Index				0.31	
Merge Area Speed				61.2	
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed				61.2	
Merge v/c ratio				0.18	
Merge Density				10.1	
Merge LOS				B	

Location	1	2	3	4	5



Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate Diverge Influence Area Operations					
Effective v_p (pcph)		754			
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FD} (Eqn 13-9)		0.736			
P_{FD} (Eqn 13-10)					
P_{FD} (Eqn 13-11)					
P_{FD}		1.000			
v_{12} (pcph)		754			
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)		754			
Diverge Speed Index		0.50			
Diverge Area Speed		55.9			
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed		55.9			
Diverge v/c ratio		0.17			
Diverge Density		9.0			
Diverge LOS		A			
Summarize Segment Operations					
Segment v/c ratio	0.16	0.17	0.14	0.18	0.17
Segment Density	5.4	9.0	4.8	10.1	5.8
Segment LOS	A	A	A	B	A
Over Capacity					

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	280	280	180	180	190	200
On Ramp Volume				10	10	
Off Ramp Volume		100				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	280	280	180	190	200	200
PHF	0.946	0.946	0.946	0.946	0.946	0.946
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	19.3%	19.3%	19.3%	19.3%	19.3%	19.3%
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}	0.912	0.912	0.912	0.912	0.912	0.912
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	325	325	209	220	232	232
GP Flow (pcphpl)	162	162	104	110	116	116
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.07	0.07	0.04	0.05	0.05	0.05
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	2.3	2.3	1.5	1.6	1.7	1.7
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		325		206	216	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.07		0.04	0.05	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		196		220	232	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.05	0.05	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				10	10	
PHF				0.7	0.75	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	33.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.858	
f_P				1.00	1.00	
On Flow (pcph)				14	16	
On Flow (pcphpl)				14	16	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.01	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		100				
PHF		0.814				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		8.8%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.958				
f_P		1.00				
Off Flow (pcph)		128				
Off Flow (pcphpl)		128				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.06				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				206	216	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				206	216	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				206	216	
v_{R12a} (pcph)				220	232	
Merge Speed Index				0.31	0.31	
Merge Area Speed				61.2	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.2	61.3	
Merge v/c ratio				0.05	0.05	
Merge Density				5.8	6.1	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		325				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.746				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		325				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		325				
Diverge Speed Index		0.31				
Diverge Area Speed		61.3				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.3				
Diverge v/c ratio		0.07				
Diverge Density		5.5				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.07	0.07	0.04	0.05	0.05	0.05
Segment Density	2.3	5.5	1.5	5.8	6.1	1.7
Segment LOS	A	A	A	A	A	A
Over Capacity						

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	191	191	177	177	238	358
On Ramp Volume				61	120	
Off Ramp Volume		14				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	191	191	177	238	358	358
PHF	0.904	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	16.5%	16.5%	16.5%	16.5%	16.5%	16.5%
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}	0.924	0.924	0.924	0.924	0.924	0.924
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	229	229	212	285	429	429
GP Flow (pcphpl)	114	114	106	142	214	214
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.05	0.05	0.04	0.06	0.09	0.09
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	1.6	1.6	1.5	2.0	3.1	3.1
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		229		204	278	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.05		0.04	0.06	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		206		285	429	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.06	0.09	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				61	120	
PHF				0.803	0.806	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				13.1%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.939	0.990	
f_P				1.00	1.00	
On Flow (pcph)				81	150	
On Flow (pcphpl)				81	150	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.04	0.07	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		14				
PHF		0.7				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		28.6%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.875				
f_P		1.00				
Off Flow (pcph)		23				
Off Flow (pcphpl)		23				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.01				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				204	278	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				204	278	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				204	278	
v_{R12a} (pcph)				285	429	
Merge Speed Index				0.31	0.30	
Merge Area Speed				61.3	61.6	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.3	61.6	
Merge v/c ratio				0.06	0.09	
Merge Density				5.8	6.9	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		229				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.753				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		229				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		229				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.05				
Diverge Density		5.0				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.05	0.05	0.04	0.06	0.09	0.09
Segment Density	1.6	5.0	1.5	5.8	6.9	3.1
Segment LOS	A	A	A	A	A	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **Existing Conditions**
Freeway Corridor: **Interstate 5 Northbound** **Time Period:** **PM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	2,200	1,500	1,250	1,250	1,500	2,250
Accel Length				200	330	
Decel Length		140				
Mainline Volume	807	807	661	661	704	706
On Ramp Volume				43	2	
Off Ramp Volume		146				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	807	807	661	704	706	706
PHF	0.919	0.919	0.919	0.919	0.919	0.919
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	19.1%	19.1%	19.1%	19.1%	19.1%	19.1%
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}	0.913	0.913	0.913	0.913	0.913	0.913
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	962	962	788	839	842	842
GP Flow (pcphpl)	481	481	394	420	421	421
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	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.20	0.20	0.16	0.17	0.18	0.18
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	6.9	6.9	5.6	6.0	6.0	6.0
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		962		779	839	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.20		0.16	0.17	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		773		839	842	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.16		0.17	0.18	

Location	1	2	3	4	5	6



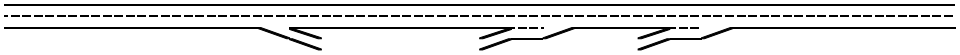
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				43	2	
PHF				0.717	0.7	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				61	3	
On Flow (pcphpl)				61	3	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	25	
On Ramp Cap (pcph)				1,900	1,900	
On Ramp v/c ratio				0.03	0.00	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		146				
PHF		0.793				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		4.8%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.977				
f_P		1.00				
Off Flow (pcph)		189				
Off Flow (pcphpl)		189				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		25				
Off Ramp Cap (pcph)		1,900				
Off Ramp v/c ratio		0.10				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				779	839	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.583	0.587	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				779	839	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				779	839	
v_{R12a} (pcph)				839	842	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.0	61.2	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.0	61.2	
Merge v/c ratio				0.18	0.18	
Merge Density				10.7	10.0	
Merge LOS				B	A	

Location	1	2	3	4	5	6



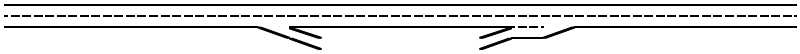
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		962				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.727				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		962				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		962				
Diverge Speed Index		0.57				
Diverge Area Speed		53.9				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		53.9				
Diverge v/c ratio		0.22				
Diverge Density		11.3				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.20	0.22	0.16	0.18	0.18	0.18
Segment Density	6.9	11.3	5.6	10.7	10.0	6.0
Segment LOS	A	B	A	B	A	A
Over Capacity						

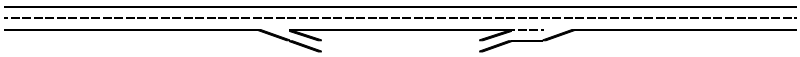
	Project:	**Shifler Mining and Reclamation**	**Alternative:**	**Existing Conditions**	
	Freeway Corridor:	**Interstate 5 Southbound**	**Time Period:**	**PM Peak Hour**	
Location	1	2	3	4	5



Key
<> Express Lane (HOV)
No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Define Freeway Segment					
Type	Basic	Diverge	Basic	Merge	Basic
Length (ft)	3,000	1,500	2,160	1,500	2,500
Accel Length				260	
Decel Length		190			
Mainline Volume	727	727	683	683	814
On Ramp Volume				131	
Off Ramp Volume		44			
Express Lane Volume					
EL On Ramp Volume					
EL Off Ramp Volume					
Calculate Flow Rate in General Purpose Lanes (GP)					
GP Volume (vph)	727	727	683	814	814
PHF	0.942	0.942	0.942	0.942	0.942
GP Lanes	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	20.4%	20.4%	20.4%	20.4%	20.4%
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}	0.907	0.907	0.907	0.907	0.907
f_P	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	850	850	799	952	952
GP Flow (pcphpl)	425	425	400	476	476
Calculate Speed in General Purpose Lanes					
Lane Width (ft)	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6
TRD	1.3	1.3	1.3	1.3	1.3
f_{LW}	0.0	0.0	0.0	0.0	0.0
f_{LC}	0.0	0.0	0.0	0.0	0.0
Calculated FFS	71.3	71.3	71.4	71.4	71.4
Measured FFS	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70
Calculate Operations in General Purpose Lanes					
v/c ratio	0.18	0.18	0.17	0.20	0.20
Speed (mph)	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	6.1	6.1	5.7	6.8	6.8
LOS	A	A	A	A	A
Calculate Operations for Entering GP Lanes					
GP_{IN} Vol (pcph)		850		809	
GP_{IN} Cap (pcph)		4,800		4,800	
GP_{IN} v/c ratio		0.18		0.17	
Calculate Operations for Exiting GP Lanes					
GP_{OUT} Vol (pcph)		792		952	
GP_{OUT} Cap (pcph)		4,800		4,800	
GP_{OUT} v/c ratio		0.16		0.20	

Location	1	2	3	4	5



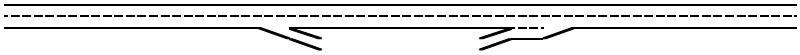
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate On Ramp Flow Rate					
On Volume (vph)				131	
PHF				0.936	
Total Lanes				1	
Terrain				Level	
Grade %				0.0%	
Grade Length (mi)				0.00	
Truck & Bus %				5.3%	
RV %				0.0%	
E_T				1.5	
E_R				1.2	
f_{HV}				0.974	
f_P				1.00	
On Flow (pcph)				144	
On Flow (pcphpl)				144	
Calculate On Ramp Roadway Operations					
On Ramp Type				Right	
On Ramp Speed (mph)				30	
On Ramp Cap (pcph)				1,900	
On Ramp v/c ratio				0.08	
Calculate Off Ramp Flow Rate					
Off Volume (vph)		44			
PHF		0.786			
Total Lanes		1			
Terrain		Level			
Grade %		0.0%			
Grade Length (mi)		0.00			
Truck & Bus %		9.1%			
RV %		0.0%			
E_T		1.5			
E_R		1.2			
f_{HV}		0.956			
f_P		1.00			
Off Flow (pcph)		59			
Off Flow (pcphpl)		59			
Calculate Off Ramp Roadway Operations					
Off Ramp Type		Right			
Off Ramp Speed		30			
Off Ramp Cap (pcph)		1,900			
Off Ramp v/c ratio		0.03			
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps					
Calculate Merge Influence Area Operations					
Effective v_P (pcph)				809	
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FM} (Eqn 13-3)				0.585	
P_{FM} (Eqn 13-4)					
P_{FM} (Eqn 13-5)					
P_{FM}				1.000	
v_{12} (pcph)				809	
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)				809	
v_{R12a} (pcph)				952	
Merge Speed Index				0.32	
Merge Area Speed				61.2	
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed				61.2	
Merge v/c ratio				0.21	
Merge Density				11.2	
Merge LOS				B	

Location	1	2	3	4	5



Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate Diverge Influence Area Operations					
Effective v_p (pcph)		850			
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FD} (Eqn 13-9)		0.736			
P_{FD} (Eqn 13-10)					
P_{FD} (Eqn 13-11)					
P_{FD}		1.000			
v_{12} (pcph)		850			
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)		850			
Diverge Speed Index		0.50			
Diverge Area Speed		56.0			
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed		56.0			
Diverge v/c ratio		0.19			
Diverge Density		9.9			
Diverge LOS		A			
Summarize Segment Operations					
Segment v/c ratio	0.18	0.19	0.17	0.21	0.20
Segment Density	6.1	9.9	5.7	11.2	6.8
Segment LOS	A	A	A	B	A
Over Capacity					

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	458	458	173	173	191	202
On Ramp Volume				18	11	
Off Ramp Volume		285				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	458	458	173	191	202	202
PHF	0.939	0.939	0.939	0.939	0.939	0.939
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	7.6%	7.6%	7.6%	7.6%	7.6%	7.6%
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}	0.963	0.963	0.963	0.963	0.963	0.963
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	506	506	191	211	223	223
GP Flow (pcphpl)	253	253	96	106	112	112
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.11	0.11	0.04	0.04	0.05	0.05
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	3.6	3.6	1.4	1.5	1.6	1.6
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		506		184	207	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.11		0.04	0.04	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		191		211	223	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.04	0.05	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				18	11	
PHF				0.7	0.7	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				11.8%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.944	0.990	
f_P				1.00	1.00	
On Flow (pcph)				27	16	
On Flow (pcphpl)				27	16	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.01	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		285				
PHF		0.913				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		2.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.990				
f_P		1.00				
Off Flow (pcph)		315				
Off Flow (pcphpl)		315				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.15				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				184	207	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				184	207	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				184	207	
v_{R12a} (pcph)				211	223	
Merge Speed Index				0.31	0.31	
Merge Area Speed				61.2	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.2	61.3	
Merge v/c ratio				0.05	0.05	
Merge Density				5.7	6.1	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		506				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.733				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		506				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		506				
Diverge Speed Index		0.33				
Diverge Area Speed		60.9				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		60.9				
Diverge v/c ratio		0.12				
Diverge Density		7.1				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.11	0.12	0.04	0.05	0.05	0.05
Segment Density	3.6	7.1	1.4	5.7	6.1	1.6
Segment LOS	A	A	A	A	A	A
Over Capacity						

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	186	186	176	176	226	436
On Ramp Volume				50	210	
Off Ramp Volume		10				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	186	186	176	226	436	436
PHF	0.886	0.886	0.886	0.886	0.886	0.886
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%
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}	0.952	0.952	0.952	0.952	0.952	0.952
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	221	221	209	268	517	517
GP Flow (pcphpl)	110	110	104	134	258	258
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.05	0.05	0.04	0.06	0.11	0.11
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	1.6	1.6	1.5	1.9	3.7	3.7
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		221		196	250	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.05		0.04	0.05	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		207		268	517	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.06	0.11	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				50	210	
PHF				0.7	0.795	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				72	267	
On Flow (pcphpl)				72	267	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.04	0.13	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		10				
PHF		0.833				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		20.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.909				
f_P		1.00				
Off Flow (pcph)		13				
Off Flow (pcphpl)		13				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.01				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				196	250	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				196	250	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				196	250	
v_{R12a} (pcph)				268	517	
Merge Speed Index				0.31	0.30	
Merge Area Speed				61.3	61.6	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.3	61.6	
Merge v/c ratio				0.06	0.11	
Merge Density				5.7	7.6	
Merge LOS				A	A	

Location	1	2	3	4	5	6



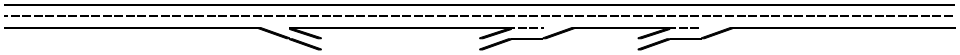
Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		221				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.754				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		221				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		221				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.05				
Diverge Density		4.9				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.05	0.05	0.04	0.06	0.11	0.11
Segment Density	1.6	4.9	1.5	5.7	7.6	3.7
Segment LOS	A	A	A	A	A	A
Over Capacity						

Location	1	2	3	4	5	6



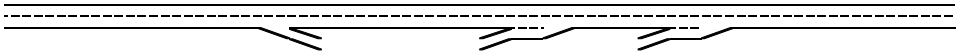
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	2,200	1,500	1,250	1,250	1,500	2,250
Accel Length				200	330	
Decel Length		140				
Mainline Volume	661	661	522	522	552	553
On Ramp Volume				30	1	
Off Ramp Volume		139				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	661	661	522	552	553	553
PHF	0.85	0.85	0.85	0.85	0.85	0.85
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	31.2%	31.2%	31.2%	31.2%	31.2%	31.2%
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}	0.865	0.865	0.865	0.865	0.865	0.865
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	899	899	710	751	752	752
GP Flow (pcphpl)	449	449	355	375	376	376
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	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.19	0.19	0.15	0.16	0.16	0.16
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	6.4	6.4	5.1	5.4	5.4	5.4
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		899		711	751	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.19		0.15	0.16	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		734		751	752	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.15		0.16	0.16	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				30	1	
PHF				0.778	0.7	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				7.1%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.966	0.990	
f_P				1.00	1.00	
On Flow (pcph)				40	1	
On Flow (pcphpl)				40	1	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	25	
On Ramp Cap (pcph)				1,900	1,900	
On Ramp v/c ratio				0.02	0.00	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		139				
PHF		0.855				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		3.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.985				
f_P		1.00				
Off Flow (pcph)		165				
Off Flow (pcphpl)		165				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		25				
Off Ramp Cap (pcph)		1,900				
Off Ramp v/c ratio		0.09				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				711	751	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.583	0.587	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				711	751	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				711	751	
v_{R12a} (pcph)				751	752	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.2	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.2	
Merge v/c ratio				0.16	0.16	
Merge Density				10.1	9.3	
Merge LOS				B	A	

Location	1	2	3	4	5	6



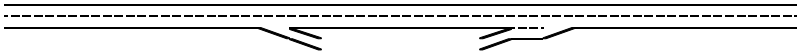
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		899				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.730				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		899				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		899				
Diverge Speed Index		0.57				
Diverge Area Speed		54.0				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		54.0				
Diverge v/c ratio		0.20				
Diverge Density		10.7				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.19	0.20	0.15	0.16	0.16	0.16
Segment Density	6.4	10.7	5.1	10.1	9.3	5.4
Segment LOS	A	B	A	B	A	A
Over Capacity						

Location	1	2	3	4	5



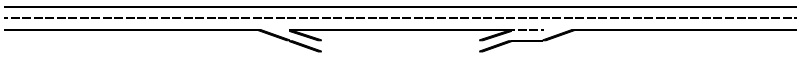
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Define Freeway Segment					
Type	Basic	Diverge	Basic	Merge	Basic
Length (ft)	3,000	1,500	2,160	1,500	2,500
Accel Length				260	
Decel Length		190			
Mainline Volume	617	617	543	543	699
On Ramp Volume				156	
Off Ramp Volume		74			
Express Lane Volume					
EL On Ramp Volume					
EL Off Ramp Volume					
Calculate Flow Rate in General Purpose Lanes (GP)					
GP Volume (vph)	617	617	543	699	699
PHF	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	21.6%	21.6%	21.6%	21.6%	21.6%
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}	0.903	0.903	0.903	0.903	0.903
f_P	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	756	756	666	857	857
GP Flow (pcphpl)	378	378	333	428	428
Calculate Speed in General Purpose Lanes					
Lane Width (ft)	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6
TRD	1.3	1.3	1.3	1.3	1.3
f_{LW}	0.0	0.0	0.0	0.0	0.0
f_{LC}	0.0	0.0	0.0	0.0	0.0
Calculated FFS	71.3	71.3	71.4	71.4	71.4
Measured FFS	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70
Calculate Operations in General Purpose Lanes					
v/c ratio	0.16	0.16	0.14	0.18	0.18
Speed (mph)	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	5.4	5.4	4.8	6.1	6.1
LOS	A	A	A	A	A
Calculate Operations for Entering GP Lanes					
GP_{IN} Vol (pcph)		756		671	
GP_{IN} Cap (pcph)		4,800		4,800	
GP_{IN} v/c ratio		0.16		0.14	
Calculate Operations for Exiting GP Lanes					
GP_{OUT} Vol (pcph)		649		857	
GP_{OUT} Cap (pcph)		4,800		4,800	
GP_{OUT} v/c ratio		0.14		0.18	

Location	1	2	3	4	5



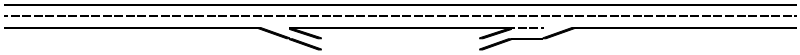
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate On Ramp Flow Rate					
On Volume (vph)				156	
PHF				0.863	
Total Lanes				1	
Terrain				Level	
Grade %				0.0%	
Grade Length (mi)				0.00	
Truck & Bus %				5.8%	
RV %				0.0%	
E_T				1.5	
E_R				1.2	
f_{HV}				0.972	
f_P				1.00	
On Flow (pcph)				186	
On Flow (pcphpl)				186	
Calculate On Ramp Roadway Operations					
On Ramp Type				Right	
On Ramp Speed (mph)				30	
On Ramp Cap (pcph)				1,900	
On Ramp v/c ratio				0.10	
Calculate Off Ramp Flow Rate					
Off Volume (vph)		74			
PHF		0.7			
Total Lanes		1			
Terrain		Level			
Grade %		0.0%			
Grade Length (mi)		0.00			
Truck & Bus %		3.8%			
RV %		0.0%			
E_T		1.5			
E_R		1.2			
f_{HV}		0.981			
f_P		1.00			
Off Flow (pcph)		108			
Off Flow (pcphpl)		108			
Calculate Off Ramp Roadway Operations					
Off Ramp Type		Right			
Off Ramp Speed		30			
Off Ramp Cap (pcph)		1,900			
Off Ramp v/c ratio		0.06			
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps					
Calculate Merge Influence Area Operations					
Effective v_P (pcph)				671	
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FM} (Eqn 13-3)				0.585	
P_{FM} (Eqn 13-4)					
P_{FM} (Eqn 13-5)					
P_{FM}				1.000	
v_{12} (pcph)				671	
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)				671	
v_{R12a} (pcph)				857	
Merge Speed Index				0.31	
Merge Area Speed				61.2	
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed				61.2	
Merge v/c ratio				0.19	
Merge Density				10.4	
Merge LOS				B	

Location	1	2	3	4	5



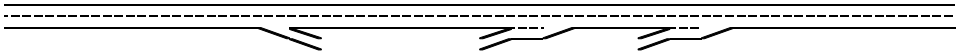
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate Diverge Influence Area Operations					
Effective v_p (pcph)		756			
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FD} (Eqn 13-9)		0.736			
P_{FD} (Eqn 13-10)					
P_{FD} (Eqn 13-11)					
P_{FD}		1.000			
v_{12} (pcph)		756			
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)		756			
Diverge Speed Index		0.50			
Diverge Area Speed		55.9			
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed		55.9			
Diverge v/c ratio		0.17			
Diverge Density		9.0			
Diverge LOS		A			
Summarize Segment Operations					
Segment v/c ratio	0.16	0.17	0.14	0.19	0.18
Segment Density	5.4	9.0	4.8	10.4	6.1
Segment LOS	A	A	A	B	A
Over Capacity					

Location	1	2	3	4	5	6



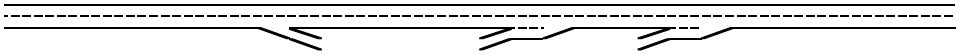
Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	282	282	172	172	182	194
On Ramp Volume				10	12	
Off Ramp Volume		110				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	282	282	172	182	194	194
PHF	0.946	0.946	0.946	0.946	0.946	0.946
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	19.3%	19.3%	19.3%	19.3%	19.3%	19.3%
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}	0.912	0.912	0.912	0.912	0.912	0.912
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	327	327	199	211	225	225
GP Flow (pcphpl)	163	163	100	105	112	112
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.07	0.07	0.04	0.04	0.05	0.05
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	2.3	2.3	1.4	1.5	1.6	1.6
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		327		197	206	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.07		0.04	0.04	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		186		211	225	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.04	0.05	

Location	1	2	3	4	5	6



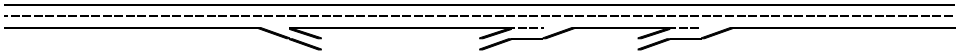
Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				10	12	
PHF				0.7	0.75	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	33.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.858	
f_P				1.00	1.00	
On Flow (pcph)				14	19	
On Flow (pcphpl)				14	19	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.01	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		110				
PHF		0.814				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		8.8%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.958				
f_P		1.00				
Off Flow (pcph)		141				
Off Flow (pcphpl)		141				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.07				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				197	206	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				197	206	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				197	206	
v_{R12a} (pcph)				211	225	
Merge Speed Index				0.31	0.31	
Merge Area Speed				61.2	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.2	61.3	
Merge v/c ratio				0.05	0.05	
Merge Density				5.7	6.1	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		327				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.745				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		327				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		327				
Diverge Speed Index		0.31				
Diverge Area Speed		61.3				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.3				
Diverge v/c ratio		0.07				
Diverge Density		5.5				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.07	0.07	0.04	0.05	0.05	0.05
Segment Density	2.3	5.5	1.4	5.7	6.1	1.6
Segment LOS	A	A	A	A	A	A
Over Capacity						

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	185	185	169	169	240	360
On Ramp Volume				71	120	
Off Ramp Volume		16				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	185	185	169	240	360	360
PHF	0.904	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	16.5%	16.5%	16.5%	16.5%	16.5%	16.5%
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}	0.924	0.924	0.924	0.924	0.924	0.924
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	222	222	202	287	431	431
GP Flow (pcphpl)	111	111	101	144	216	216
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.05	0.05	0.04	0.06	0.09	0.09
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	1.6	1.6	1.4	2.1	3.1	3.1
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		222		193	281	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.05		0.04	0.06	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		195		287	431	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.06	0.09	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				71	120	
PHF				0.803	0.806	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				13.1%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.939	0.990	
f_P				1.00	1.00	
On Flow (pcph)				94	150	
On Flow (pcphpl)				94	150	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.05	0.07	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		16				
PHF		0.7				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		28.6%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.875				
f_P		1.00				
Off Flow (pcph)		26				
Off Flow (pcphpl)		26				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.01				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				193	281	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				193	281	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				193	281	
v_{R12a} (pcph)				287	431	
Merge Speed Index				0.31	0.30	
Merge Area Speed				61.3	61.6	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.3	61.6	
Merge v/c ratio				0.06	0.09	
Merge Density				5.9	6.9	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		222				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.753				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		222				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		222				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.05				
Diverge Density		4.9				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.05	0.05	0.04	0.06	0.09	0.09
Segment Density	1.6	4.9	1.4	5.9	6.9	3.1
Segment LOS	A	A	A	A	A	A
Over Capacity						

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	2,200	1,500	1,250	1,250	1,500	2,250
Accel Length				200	330	
Decel Length		140				
Mainline Volume	808	808	661	661	704	706
On Ramp Volume				43	2	
Off Ramp Volume		147				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	808	808	661	704	706	706
PHF	0.919	0.919	0.919	0.919	0.919	0.919
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	19.1%	19.1%	19.1%	19.1%	19.1%	19.1%
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}	0.913	0.913	0.913	0.913	0.913	0.913
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	963	963	788	839	842	842
GP Flow (pcphpl)	482	482	394	420	421	421
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	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.20	0.20	0.16	0.17	0.18	0.18
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	6.9	6.9	5.6	6.0	6.0	6.0
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		963		779	839	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.20		0.16	0.17	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		773		839	842	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.16		0.17	0.18	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				43	2	
PHF				0.717	0.7	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				61	3	
On Flow (pcphpl)				61	3	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	25	
On Ramp Cap (pcph)				1,900	1,900	
On Ramp v/c ratio				0.03	0.00	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		147				
PHF		0.793				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		4.8%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.977				
f_P		1.00				
Off Flow (pcph)		190				
Off Flow (pcphpl)		190				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		25				
Off Ramp Cap (pcph)		1,900				
Off Ramp v/c ratio		0.10				
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)				779	839	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.583	0.587	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				779	839	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				779	839	
v_{R12a} (pcph)				839	842	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.0	61.2	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.0	61.2	
Merge v/c ratio				0.18	0.18	
Merge Density				10.7	10.0	
Merge LOS				B	A	

Location	1	2	3	4	5	6



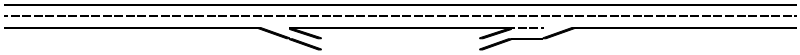
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		963				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.727				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		963				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		963				
Diverge Speed Index		0.58				
Diverge Area Speed		53.9				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		53.9				
Diverge v/c ratio		0.22				
Diverge Density		11.3				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.20	0.22	0.16	0.18	0.18	0.18
Segment Density	6.9	11.3	5.6	10.7	10.0	6.0
Segment LOS	A	B	A	B	A	A
Over Capacity						

Location	1	2	3	4	5



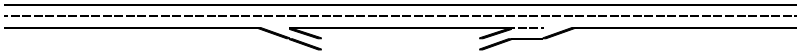
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Define Freeway Segment					
Type	Basic	Diverge	Basic	Merge	Basic
Length (ft)	3,000	1,500	2,160	1,500	2,500
Accel Length				260	
Decel Length		190			
Mainline Volume	727	727	683	683	815
On Ramp Volume				132	
Off Ramp Volume		44			
Express Lane Volume					
EL On Ramp Volume					
EL Off Ramp Volume					
Calculate Flow Rate in General Purpose Lanes (GP)					
GP Volume (vph)	727	727	683	815	815
PHF	0.942	0.942	0.942	0.942	0.942
GP Lanes	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	20.4%	20.4%	20.4%	20.4%	20.4%
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}	0.907	0.907	0.907	0.907	0.907
f_P	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	850	850	799	953	953
GP Flow (pcphpl)	425	425	400	477	477
Calculate Speed in General Purpose Lanes					
Lane Width (ft)	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6
TRD	1.3	1.3	1.3	1.3	1.3
f_{LW}	0.0	0.0	0.0	0.0	0.0
f_{LC}	0.0	0.0	0.0	0.0	0.0
Calculated FFS	71.3	71.3	71.4	71.4	71.4
Measured FFS	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70
Calculate Operations in General Purpose Lanes					
v/c ratio	0.18	0.18	0.17	0.20	0.20
Speed (mph)	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	6.1	6.1	5.7	6.8	6.8
LOS	A	A	A	A	A
Calculate Operations for Entering GP Lanes					
GP_{IN} Vol (pcph)		850		809	
GP_{IN} Cap (pcph)		4,800		4,800	
GP_{IN} v/c ratio		0.18		0.17	
Calculate Operations for Exiting GP Lanes					
GP_{OUT} Vol (pcph)		792		953	
GP_{OUT} Cap (pcph)		4,800		4,800	
GP_{OUT} v/c ratio		0.16		0.20	

Location	1	2	3	4	5



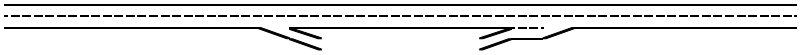
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate On Ramp Flow Rate					
On Volume (vph)				132	
PHF				0.936	
Total Lanes				1	
Terrain				Level	
Grade %				0.0%	
Grade Length (mi)				0.00	
Truck & Bus %				5.3%	
RV %				0.0%	
E_T				1.5	
E_R				1.2	
f_{HV}				0.974	
f_P				1.00	
On Flow (pcph)				145	
On Flow (pcphpl)				145	
Calculate On Ramp Roadway Operations					
On Ramp Type				Right	
On Ramp Speed (mph)				30	
On Ramp Cap (pcph)				1,900	
On Ramp v/c ratio				0.08	
Calculate Off Ramp Flow Rate					
Off Volume (vph)		44			
PHF		0.786			
Total Lanes		1			
Terrain		Level			
Grade %		0.0%			
Grade Length (mi)		0.00			
Truck & Bus %		9.1%			
RV %		0.0%			
E_T		1.5			
E_R		1.2			
f_{HV}		0.956			
f_P		1.00			
Off Flow (pcph)		59			
Off Flow (pcphpl)		59			
Calculate Off Ramp Roadway Operations					
Off Ramp Type		Right			
Off Ramp Speed		30			
Off Ramp Cap (pcph)		1,900			
Off Ramp v/c ratio		0.03			
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps					
Calculate Merge Influence Area Operations					
Effective v_P (pcph)				809	
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FM} (Eqn 13-3)				0.585	
P_{FM} (Eqn 13-4)					
P_{FM} (Eqn 13-5)					
P_{FM}				1.000	
v_{12} (pcph)				809	
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)				809	
v_{R12a} (pcph)				953	
Merge Speed Index				0.32	
Merge Area Speed				61.2	
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed				61.2	
Merge v/c ratio				0.21	
Merge Density				11.2	
Merge LOS				B	

Location	1	2	3	4	5



Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate Diverge Influence Area Operations					
Effective v_p (pcph)		850			
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FD} (Eqn 13-9)		0.736			
P_{FD} (Eqn 13-10)					
P_{FD} (Eqn 13-11)					
P_{FD}		1.000			
v_{12} (pcph)		850			
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)		850			
Diverge Speed Index		0.50			
Diverge Area Speed		56.0			
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed		56.0			
Diverge v/c ratio		0.19			
Diverge Density		9.9			
Diverge LOS		A			
Summarize Segment Operations					
Segment v/c ratio	0.18	0.19	0.17	0.21	0.20
Segment Density	6.1	9.9	5.7	11.2	6.8
Segment LOS	A	A	A	B	A
Over Capacity					

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	459	459	173	173	191	202
On Ramp Volume				18	11	
Off Ramp Volume		286				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	459	459	173	191	202	202
PHF	0.939	0.939	0.939	0.939	0.939	0.939
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	7.6%	7.6%	7.6%	7.6%	7.6%	7.6%
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}	0.963	0.963	0.963	0.963	0.963	0.963
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	507	507	191	211	223	223
GP Flow (pcphpl)	254	254	96	106	112	112
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.11	0.11	0.04	0.04	0.05	0.05
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	3.6	3.6	1.4	1.5	1.6	1.6
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		507		184	207	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.11		0.04	0.04	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		191		211	223	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.04	0.05	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				18	11	
PHF				0.7	0.7	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				11.8%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.944	0.990	
f_P				1.00	1.00	
On Flow (pcph)				27	16	
On Flow (pcphpl)				27	16	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.01	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		286				
PHF		0.913				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		2.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.990				
f_P		1.00				
Off Flow (pcph)		316				
Off Flow (pcphpl)		316				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.15				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				184	207	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				184	207	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				184	207	
v_{R12a} (pcph)				211	223	
Merge Speed Index				0.31	0.31	
Merge Area Speed				61.2	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.2	61.3	
Merge v/c ratio				0.05	0.05	
Merge Density				5.7	6.1	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		507				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.733				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		507				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		507				
Diverge Speed Index		0.33				
Diverge Area Speed		60.9				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		60.9				
Diverge v/c ratio		0.12				
Diverge Density		7.1				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.11	0.12	0.04	0.05	0.05	0.05
Segment Density	3.6	7.1	1.4	5.7	6.1	1.6
Segment LOS	A	A	A	A	A	A
Over Capacity						

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	186	186	176	176	227	437
On Ramp Volume				51	210	
Off Ramp Volume		10				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	186	186	176	227	437	437
PHF	0.886	0.886	0.886	0.886	0.886	0.886
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%
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}	0.952	0.952	0.952	0.952	0.952	0.952
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	221	221	209	269	518	518
GP Flow (pcphpl)	110	110	104	135	259	259
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.05	0.05	0.04	0.06	0.11	0.11
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	1.6	1.6	1.5	1.9	3.7	3.7
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		221		196	251	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.05		0.04	0.05	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		207		269	518	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.06	0.11	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				51	210	
PHF				0.7	0.795	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				74	267	
On Flow (pcphpl)				74	267	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.04	0.13	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		10				
PHF		0.833				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		20.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.909				
f_P		1.00				
Off Flow (pcph)		13				
Off Flow (pcphpl)		13				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.01				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				196	251	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				196	251	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				196	251	
v_{R12a} (pcph)				269	518	
Merge Speed Index				0.31	0.30	
Merge Area Speed				61.3	61.6	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.3	61.6	
Merge v/c ratio				0.06	0.11	
Merge Density				5.7	7.6	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		221				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.754				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		221				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		221				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.05				
Diverge Density		4.9				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.05	0.05	0.04	0.06	0.11	0.11
Segment Density	1.6	4.9	1.5	5.7	7.6	3.7
Segment LOS	A	A	A	A	A	A
Over Capacity						

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	2,200	1,500	1,250	1,250	1,500	2,250
Accel Length				200	330	
Decel Length		140				
Mainline Volume	692	692	522	522	554	555
On Ramp Volume				32	1	
Off Ramp Volume		170				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	692	692	522	554	555	555
PHF	0.85	0.85	0.85	0.85	0.85	0.85
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	31.2%	31.2%	31.2%	31.2%	31.2%	31.2%
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}	0.865	0.865	0.865	0.865	0.865	0.865
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	941	941	710	753	755	755
GP Flow (pcphpl)	471	471	355	377	377	377
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	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.20	0.20	0.15	0.16	0.16	0.16
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	6.7	6.7	5.1	5.4	5.4	5.4
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		941		711	753	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.20		0.15	0.16	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		739		753	755	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.15		0.16	0.16	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				32	1	
PHF				0.778	0.7	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				7.1%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.966	0.990	
f_P				1.00	1.00	
On Flow (pcph)				43	1	
On Flow (pcphpl)				43	1	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	25	
On Ramp Cap (pcph)				1,900	1,900	
On Ramp v/c ratio				0.02	0.00	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		170				
PHF		0.855				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		3.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.985				
f_P		1.00				
Off Flow (pcph)		202				
Off Flow (pcphpl)		202				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		25				
Off Ramp Cap (pcph)		1,900				
Off Ramp v/c ratio		0.11				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				711	753	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.583	0.587	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				711	753	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				711	753	
v_{R12a} (pcph)				753	755	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.2	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.2	
Merge v/c ratio				0.16	0.16	
Merge Density				10.1	9.3	
Merge LOS				B	A	

Location	1	2	3	4	5	6



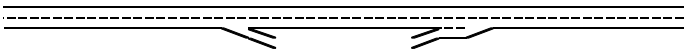
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		941				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.727				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		941				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		941				
Diverge Speed Index		0.58				
Diverge Area Speed		53.9				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		53.9				
Diverge v/c ratio		0.21				
Diverge Density		11.1				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.20	0.21	0.15	0.16	0.16	0.16
Segment Density	6.7	11.1	5.1	10.1	9.3	5.4
Segment LOS	A	B	A	B	A	A
Over Capacity						

Location	1	2	3	4	5



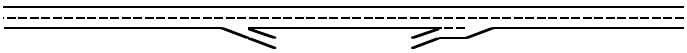
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Define Freeway Segment					
Type	Basic	Diverge	Basic	Merge	Basic
Length (ft)	3,000	1,500	2,160	1,500	2,500
Accel Length				260	
Decel Length		190			
Mainline Volume	619	619	543	543	730
On Ramp Volume				187	
Off Ramp Volume		76			
Express Lane Volume					
EL On Ramp Volume					
EL Off Ramp Volume					
Calculate Flow Rate in General Purpose Lanes (GP)					
GP Volume (vph)	619	619	543	730	730
PHF	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	21.6%	21.6%	21.6%	21.6%	21.6%
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}	0.903	0.903	0.903	0.903	0.903
f_P	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	759	759	666	895	895
GP Flow (pcphpl)	379	379	333	447	447
Calculate Speed in General Purpose Lanes					
Lane Width (ft)	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6
TRD	1.3	1.3	1.3	1.3	1.3
f_{LW}	0.0	0.0	0.0	0.0	0.0
f_{LC}	0.0	0.0	0.0	0.0	0.0
Calculated FFS	71.3	71.3	71.4	71.4	71.4
Measured FFS	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70
Calculate Operations in General Purpose Lanes					
v/c ratio	0.16	0.16	0.14	0.19	0.19
Speed (mph)	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	5.4	5.4	4.8	6.4	6.4
LOS	A	A	A	A	A
Calculate Operations for Entering GP Lanes					
GP_{IN} Vol (pcph)		759		672	
GP_{IN} Cap (pcph)		4,800		4,800	
GP_{IN} v/c ratio		0.16		0.14	
Calculate Operations for Exiting GP Lanes					
GP_{OUT} Vol (pcph)		648		895	
GP_{OUT} Cap (pcph)		4,800		4,800	
GP_{OUT} v/c ratio		0.14		0.19	

Location	1	2	3	4	5



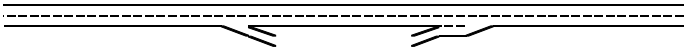
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate On Ramp Flow Rate					
On Volume (vph)				187	
PHF				0.863	
Total Lanes				1	
Terrain				Level	
Grade %				0.0%	
Grade Length (mi)				0.00	
Truck & Bus %				5.8%	
RV %				0.0%	
E_T				1.5	
E_R				1.2	
f_{HV}				0.972	
f_P				1.00	
On Flow (pcph)				223	
On Flow (pcphpl)				223	
Calculate On Ramp Roadway Operations					
On Ramp Type				Right	
On Ramp Speed (mph)				30	
On Ramp Cap (pcph)				1,900	
On Ramp v/c ratio				0.12	
Calculate Off Ramp Flow Rate					
Off Volume (vph)		76			
PHF		0.7			
Total Lanes		1			
Terrain		Level			
Grade %		0.0%			
Grade Length (mi)		0.00			
Truck & Bus %		3.8%			
RV %		0.0%			
E_T		1.5			
E_R		1.2			
f_{HV}		0.981			
f_P		1.00			
Off Flow (pcph)		111			
Off Flow (pcphpl)		111			
Calculate Off Ramp Roadway Operations					
Off Ramp Type		Right			
Off Ramp Speed		30			
Off Ramp Cap (pcph)		1,900			
Off Ramp v/c ratio		0.06			
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps					
Calculate Merge Influence Area Operations					
Effective v_P (pcph)				672	
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FM} (Eqn 13-3)				0.585	
P_{FM} (Eqn 13-4)					
P_{FM} (Eqn 13-5)					
P_{FM}				1.000	
v_{12} (pcph)				672	
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)				672	
v_{R12a} (pcph)				895	
Merge Speed Index				0.31	
Merge Area Speed				61.2	
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed				61.2	
Merge v/c ratio				0.19	
Merge Density				10.7	
Merge LOS				B	

Location	1	2	3	4	5



Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate Diverge Influence Area Operations					
Effective v_P (pcph)		759			
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FD} (Eqn 13-9)		0.736			
P_{FD} (Eqn 13-10)					
P_{FD} (Eqn 13-11)					
P_{FD}		1.000			
v_{12} (pcph)		759			
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)		759			
Diverge Speed Index		0.50			
Diverge Area Speed		55.9			
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed		55.9			
Diverge v/c ratio		0.17			
Diverge Density		9.1			
Diverge LOS		A			
Summarize Segment Operations					
Segment v/c ratio	0.16	0.17	0.14	0.19	0.19
Segment Density	5.4	9.1	4.8	10.7	6.4
Segment LOS	A	A	A	B	A
Over Capacity					

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	291	291	172	172	182	196
On Ramp Volume				10	14	
Off Ramp Volume		119				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	291	291	172	182	196	196
PHF	0.946	0.946	0.946	0.946	0.946	0.946
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	19.3%	19.3%	19.3%	19.3%	19.3%	19.3%
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}	0.912	0.912	0.912	0.912	0.912	0.912
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	337	337	199	211	227	227
GP Flow (pcphpl)	169	169	100	105	114	114
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.07	0.07	0.04	0.04	0.05	0.05
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	2.4	2.4	1.4	1.5	1.6	1.6
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		337		197	205	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.07		0.04	0.04	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		185		211	227	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.04	0.05	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				10	14	
PHF				0.7	0.75	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	33.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.858	
f_P				1.00	1.00	
On Flow (pcph)				14	22	
On Flow (pcphpl)				14	22	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.01	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		119				
PHF		0.814				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		8.8%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.958				
f_P		1.00				
Off Flow (pcph)		153				
Off Flow (pcphpl)		153				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.07				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				197	205	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				197	205	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				197	205	
v_{R12a} (pcph)				211	227	
Merge Speed Index				0.31	0.31	
Merge Area Speed				61.2	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.2	61.3	
Merge v/c ratio				0.05	0.05	
Merge Density				5.7	6.1	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		337				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.745				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		337				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		337				
Diverge Speed Index		0.31				
Diverge Area Speed		61.3				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.3				
Diverge v/c ratio		0.08				
Diverge Density		5.6				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.07	0.08	0.04	0.05	0.05	0.05
Segment Density	2.4	5.6	1.4	5.7	6.1	1.6
Segment LOS	A	A	A	A	A	A
Over Capacity						

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	187	187	169	169	249	369
On Ramp Volume				80	120	
Off Ramp Volume		18				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	187	187	169	249	369	369
PHF	0.904	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	16.5%	16.5%	16.5%	16.5%	16.5%	16.5%
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}	0.924	0.924	0.924	0.924	0.924	0.924
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	224	224	202	298	442	442
GP Flow (pcphpl)	112	112	101	149	221	221
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.05	0.05	0.04	0.06	0.09	0.09
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	1.6	1.6	1.4	2.1	3.2	3.2
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		224		192	291	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.05		0.04	0.06	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		195		298	442	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.06	0.09	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				80	120	
PHF				0.803	0.806	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				13.1%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.939	0.990	
f_P				1.00	1.00	
On Flow (pcph)				106	150	
On Flow (pcphpl)				106	150	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.06	0.07	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		18				
PHF		0.7				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		28.6%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.875				
f_P		1.00				
Off Flow (pcph)		29				
Off Flow (pcphpl)		29				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.01				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				192	291	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				192	291	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				192	291	
v_{R12a} (pcph)				298	442	
Merge Speed Index				0.31	0.30	
Merge Area Speed				61.3	61.6	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.3	61.6	
Merge v/c ratio				0.06	0.10	
Merge Density				5.9	7.0	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		224				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.753				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		224				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		224				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.05				
Diverge Density		4.9				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.05	0.05	0.04	0.06	0.10	0.09
Segment Density	1.6	4.9	1.4	5.9	7.0	3.2
Segment LOS	A	A	A	A	A	A
Over Capacity						

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	2,200	1,500	1,250	1,250	1,500	2,250
Accel Length				200	330	
Decel Length		140				
Mainline Volume	810	810	661	661	704	706
On Ramp Volume				43	2	
Off Ramp Volume		149				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	810	810	661	704	706	706
PHF	0.919	0.919	0.919	0.919	0.919	0.919
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	19.1%	19.1%	19.1%	19.1%	19.1%	19.1%
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}	0.913	0.913	0.913	0.913	0.913	0.913
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	966	966	788	839	842	842
GP Flow (pcphpl)	483	483	394	420	421	421
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	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.20	0.20	0.16	0.17	0.18	0.18
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	6.9	6.9	5.6	6.0	6.0	6.0
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		966		779	839	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.20		0.16	0.17	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		773		839	842	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.16		0.17	0.18	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				43	2	
PHF				0.717	0.7	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				61	3	
On Flow (pcphpl)				61	3	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	25	
On Ramp Cap (pcph)				1,900	1,900	
On Ramp v/c ratio				0.03	0.00	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		149				
PHF		0.793				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		4.8%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.977				
f_P		1.00				
Off Flow (pcph)		192				
Off Flow (pcphpl)		192				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		25				
Off Ramp Cap (pcph)		1,900				
Off Ramp v/c ratio		0.10				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				779	839	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.583	0.587	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				779	839	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				779	839	
v_{R12a} (pcph)				839	842	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.0	61.2	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.0	61.2	
Merge v/c ratio				0.18	0.18	
Merge Density				10.7	10.0	
Merge LOS				B	A	

Location	1	2	3	4	5	6



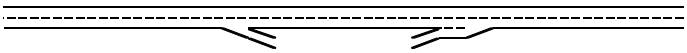
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		966				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.727				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		966				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		966				
Diverge Speed Index		0.58				
Diverge Area Speed		53.9				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		53.9				
Diverge v/c ratio		0.22				
Diverge Density		11.3				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.20	0.22	0.16	0.18	0.18	0.18
Segment Density	6.9	11.3	5.6	10.7	10.0	6.0
Segment LOS	A	B	A	B	A	A
Over Capacity						

Location	1	2	3	4	5



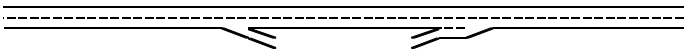
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Define Freeway Segment					
Type	Basic	Diverge	Basic	Merge	Basic
Length (ft)	3,000	1,500	2,160	1,500	2,500
Accel Length				260	
Decel Length		190			
Mainline Volume	727	727	683	683	817
On Ramp Volume				134	
Off Ramp Volume		44			
Express Lane Volume					
EL On Ramp Volume					
EL Off Ramp Volume					
Calculate Flow Rate in General Purpose Lanes (GP)					
GP Volume (vph)	727	727	683	817	817
PHF	0.942	0.942	0.942	0.942	0.942
GP Lanes	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	20.4%	20.4%	20.4%	20.4%	20.4%
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}	0.907	0.907	0.907	0.907	0.907
f_P	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	850	850	799	956	956
GP Flow (pcphpl)	425	425	400	478	478
Calculate Speed in General Purpose Lanes					
Lane Width (ft)	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6
TRD	1.3	1.3	1.3	1.3	1.3
f_{LW}	0.0	0.0	0.0	0.0	0.0
f_{LC}	0.0	0.0	0.0	0.0	0.0
Calculated FFS	71.3	71.3	71.4	71.4	71.4
Measured FFS	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70
Calculate Operations in General Purpose Lanes					
v/c ratio	0.18	0.18	0.17	0.20	0.20
Speed (mph)	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	6.1	6.1	5.7	6.8	6.8
LOS	A	A	A	A	A
Calculate Operations for Entering GP Lanes					
GP_{IN} Vol (pcph)		850		809	
GP_{IN} Cap (pcph)		4,800		4,800	
GP_{IN} v/c ratio		0.18		0.17	
Calculate Operations for Exiting GP Lanes					
GP_{OUT} Vol (pcph)		792		956	
GP_{OUT} Cap (pcph)		4,800		4,800	
GP_{OUT} v/c ratio		0.16		0.20	

Location	1	2	3	4	5



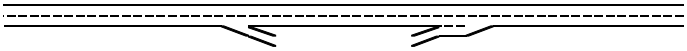
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate On Ramp Flow Rate					
On Volume (vph)				134	
PHF				0.936	
Total Lanes				1	
Terrain				Level	
Grade %				0.0%	
Grade Length (mi)				0.00	
Truck & Bus %				5.3%	
RV %				0.0%	
E_T				1.5	
E_R				1.2	
f_{HV}				0.974	
f_P				1.00	
On Flow (pcph)				147	
On Flow (pcphpl)				147	
Calculate On Ramp Roadway Operations					
On Ramp Type				Right	
On Ramp Speed (mph)				30	
On Ramp Cap (pcph)				1,900	
On Ramp v/c ratio				0.08	
Calculate Off Ramp Flow Rate					
Off Volume (vph)		44			
PHF		0.786			
Total Lanes		1			
Terrain		Level			
Grade %		0.0%			
Grade Length (mi)		0.00			
Truck & Bus %		9.1%			
RV %		0.0%			
E_T		1.5			
E_R		1.2			
f_{HV}		0.956			
f_P		1.00			
Off Flow (pcph)		59			
Off Flow (pcphpl)		59			
Calculate Off Ramp Roadway Operations					
Off Ramp Type		Right			
Off Ramp Speed		30			
Off Ramp Cap (pcph)		1,900			
Off Ramp v/c ratio		0.03			
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps					
Calculate Merge Influence Area Operations					
Effective v_P (pcph)				809	
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FM} (Eqn 13-3)				0.585	
P_{FM} (Eqn 13-4)					
P_{FM} (Eqn 13-5)					
P_{FM}				1.000	
v_{12} (pcph)				809	
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)				809	
v_{R12a} (pcph)				956	
Merge Speed Index				0.32	
Merge Area Speed				61.2	
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed				61.2	
Merge v/c ratio				0.21	
Merge Density				11.2	
Merge LOS				B	

Location	1	2	3	4	5



Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate Diverge Influence Area Operations					
Effective v_P (pcph)		850			
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FD} (Eqn 13-9)		0.736			
P_{FD} (Eqn 13-10)					
P_{FD} (Eqn 13-11)					
P_{FD}		1.000			
v_{12} (pcph)		850			
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)		850			
Diverge Speed Index		0.50			
Diverge Area Speed		56.0			
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed		56.0			
Diverge v/c ratio		0.19			
Diverge Density		9.9			
Diverge LOS		A			
Summarize Segment Operations					
Segment v/c ratio	0.18	0.19	0.17	0.21	0.20
Segment Density	6.1	9.9	5.7	11.2	6.8
Segment LOS	A	A	A	B	A
Over Capacity					

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	459	459	173	173	191	202
On Ramp Volume				18	11	
Off Ramp Volume		286				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	459	459	173	191	202	202
PHF	0.939	0.939	0.939	0.939	0.939	0.939
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	7.6%	7.6%	7.6%	7.6%	7.6%	7.6%
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}	0.963	0.963	0.963	0.963	0.963	0.963
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	507	507	191	211	223	223
GP Flow (pcphpl)	254	254	96	106	112	112
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.11	0.11	0.04	0.04	0.05	0.05
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	3.6	3.6	1.4	1.5	1.6	1.6
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		507		184	207	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.11		0.04	0.04	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		191		211	223	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.04	0.05	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				18	11	
PHF				0.7	0.7	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				11.8%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.944	0.990	
f_P				1.00	1.00	
On Flow (pcph)				27	16	
On Flow (pcphpl)				27	16	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.01	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		286				
PHF		0.913				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		2.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.990				
f_P		1.00				
Off Flow (pcph)		316				
Off Flow (pcphpl)		316				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.15				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				184	207	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				184	207	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				184	207	
v_{R12a} (pcph)				211	223	
Merge Speed Index				0.31	0.31	
Merge Area Speed				61.2	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.2	61.3	
Merge v/c ratio				0.05	0.05	
Merge Density				5.7	6.1	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		507				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.733				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		507				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		507				
Diverge Speed Index		0.33				
Diverge Area Speed		60.9				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		60.9				
Diverge v/c ratio		0.12				
Diverge Density		7.1				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.11	0.12	0.04	0.05	0.05	0.05
Segment Density	3.6	7.1	1.4	5.7	6.1	1.6
Segment LOS	A	A	A	A	A	A
Over Capacity						

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	186	186	176	176	227	437
On Ramp Volume				51	210	
Off Ramp Volume		10				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	186	186	176	227	437	437
PHF	0.886	0.886	0.886	0.886	0.886	0.886
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%
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}	0.952	0.952	0.952	0.952	0.952	0.952
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	221	221	209	269	518	518
GP Flow (pcphpl)	110	110	104	135	259	259
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.05	0.05	0.04	0.06	0.11	0.11
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	1.6	1.6	1.5	1.9	3.7	3.7
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		221		196	251	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.05		0.04	0.05	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		207		269	518	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.04		0.06	0.11	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				51	210	
PHF				0.7	0.795	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				74	267	
On Flow (pcphpl)				74	267	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.04	0.13	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		10				
PHF		0.833				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		20.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.909				
f_P		1.00				
Off Flow (pcph)		13				
Off Flow (pcphpl)		13				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.01				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				196	251	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				196	251	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				196	251	
v_{R12a} (pcph)				269	518	
Merge Speed Index				0.31	0.30	
Merge Area Speed				61.3	61.6	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.3	61.6	
Merge v/c ratio				0.06	0.11	
Merge Density				5.7	7.6	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_P (pcph)		221				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.754				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		221				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		221				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.05				
Diverge Density		4.9				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.05	0.05	0.04	0.06	0.11	0.11
Segment Density	1.6	4.9	1.5	5.7	7.6	3.7
Segment LOS	A	A	A	A	A	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **Cumulative Baseline Conditions**
Freeway Corridor: **Interstate 5 Northbound** **Time Period:** **AM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	2,200	1,500	1,250	1,250	1,500	2,250
Accel Length				200	330	
Decel Length		140				
Mainline Volume	1,316	1,316	1,155	1,155	1,207	1,212
On Ramp Volume				52	5	
Off Ramp Volume		161				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	1,316	1,316	1,155	1,207	1,212	1,212
PHF	0.88	0.88	0.88	0.88	0.88	0.88
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%
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}	0.858	0.858	0.858	0.858	0.858	0.858
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,742	1,742	1,529	1,598	1,605	1,605
GP Flow (pcphpl)	871	871	765	799	802	802
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	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.36	0.36	0.32	0.33	0.33	0.33
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	12.4	12.4	10.9	11.4	11.5	11.5
LOS	B	B	A	B	B	B
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,742		1,535	1,599	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.36		0.32	0.33	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		1,536		1,598	1,605	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.32		0.33	0.33	

Location	1	2	3	4	5	6



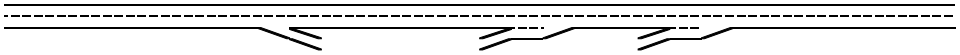
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				52	5	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				12.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.943	0.990	
f_P				1.00	1.00	
On Flow (pcph)				63	6	
On Flow (pcphpl)				63	6	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	25	
On Ramp Cap (pcph)				1,900	1,900	
On Ramp v/c ratio				0.03	0.00	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		161				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		25.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.889				
f_P		1.00				
Off Flow (pcph)		206				
Off Flow (pcphpl)		206				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		25				
Off Ramp Cap (pcph)		1,900				
Off Ramp v/c ratio		0.11				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				1,535	1,599	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.583	0.587	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				1,535	1,599	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				1,535	1,599	
v_{R12a} (pcph)				1,598	1,605	
Merge Speed Index				0.33	0.32	
Merge Area Speed				60.8	60.9	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				60.8	60.9	
Merge v/c ratio				0.35	0.35	
Merge Density				16.7	15.9	
Merge LOS				B	B	

Location	1	2	3	4	5	6



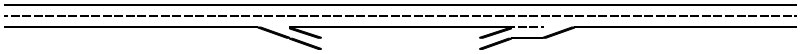
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,742				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.707				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,742				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,742				
Diverge Speed Index		0.58				
Diverge Area Speed		53.9				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		53.9				
Diverge v/c ratio		0.40				
Diverge Density		18.0				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.36	0.40	0.32	0.35	0.35	0.33
Segment Density	12.4	18.0	10.9	16.7	15.9	11.5
Segment LOS	B	B	A	B	B	B
Over Capacity						

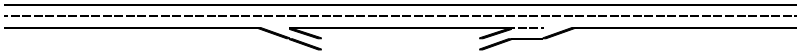
	Project:	**Shifler Mining and Reclamation**	**Alternative:**	**Cumulative Baseline Cor**	
	Freeway Corridor:	**Interstate 5 Southbound**	**Time Period:**	**AM Peak Hour**	
Location	1	2	3	4	5



Key
<> Express Lane (HOV)
No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Define Freeway Segment					
Type	Basic	Diverge	Basic	Merge	Basic
Length (ft)	3,000	1,500	2,160	1,500	2,500
Accel Length				260	
Decel Length		190			
Mainline Volume	1,152	1,152	1,064	1,064	1,255
On Ramp Volume				191	
Off Ramp Volume		88			
Express Lane Volume					
EL On Ramp Volume					
EL Off Ramp Volume					
Calculate Flow Rate in General Purpose Lanes (GP)					
GP Volume (vph)	1,152	1,152	1,064	1,255	1,255
PHF	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	22.0%	22.0%	22.0%	22.0%	22.0%
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}	0.901	0.901	0.901	0.901	0.901
f_P	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,415	1,415	1,306	1,541	1,541
GP Flow (pcphpl)	707	707	653	770	770
Calculate Speed in General Purpose Lanes					
Lane Width (ft)	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6
TRD	1.3	1.3	1.3	1.3	1.3
f_{LW}	0.0	0.0	0.0	0.0	0.0
f_{LC}	0.0	0.0	0.0	0.0	0.0
Calculated FFS	71.3	71.3	71.4	71.4	71.4
Measured FFS	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70
Calculate Operations in General Purpose Lanes					
v/c ratio	0.29	0.29	0.27	0.32	0.32
Speed (mph)	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	10.1	10.1	9.3	11.0	11.0
LOS	A	A	A	B	B
Calculate Operations for Entering GP Lanes					
GP_{IN} Vol (pcph)		1,415		1,295	
GP_{IN} Cap (pcph)		4,800		4,800	
GP_{IN} v/c ratio		0.29		0.27	
Calculate Operations for Exiting GP Lanes					
GP_{OUT} Vol (pcph)		1,311		1,541	
GP_{OUT} Cap (pcph)		4,800		4,800	
GP_{OUT} v/c ratio		0.27		0.32	

Location	1	2	3	4	5



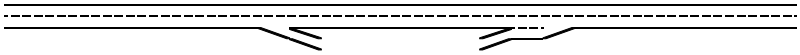
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate On Ramp Flow Rate					
On Volume (vph)				191	
PHF				0.88	
Total Lanes				1	
Terrain				Level	
Grade %				0.0%	
Grade Length (mi)				0.00	
Truck & Bus %				27.0%	
RV %				0.0%	
E_T				1.5	
E_R				1.2	
f_{HV}				0.881	
f_P				1.00	
On Flow (pcph)				246	
On Flow (pcphpl)				246	
Calculate On Ramp Roadway Operations					
On Ramp Type				Right	
On Ramp Speed (mph)				30	
On Ramp Cap (pcph)				1,900	
On Ramp v/c ratio				0.13	
Calculate Off Ramp Flow Rate					
Off Volume (vph)		88			
PHF		0.88			
Total Lanes		1			
Terrain		Level			
Grade %		0.0%			
Grade Length (mi)		0.00			
Truck & Bus %		7.0%			
RV %		0.0%			
E_T		1.5			
E_R		1.2			
f_{HV}		0.966			
f_P		1.00			
Off Flow (pcph)		104			
Off Flow (pcphpl)		104			
Calculate Off Ramp Roadway Operations					
Off Ramp Type		Right			
Off Ramp Speed		30			
Off Ramp Cap (pcph)		1,900			
Off Ramp v/c ratio		0.05			
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps					
Calculate Merge Influence Area Operations					
Effective v_P (pcph)				1,295	
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FM} (Eqn 13-3)				0.585	
P_{FM} (Eqn 13-4)					
P_{FM} (Eqn 13-5)					
P_{FM}				1.000	
v_{12} (pcph)				1,295	
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)				1,295	
v_{R12a} (pcph)				1,541	
Merge Speed Index				0.32	
Merge Area Speed				60.9	
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed				60.9	
Merge v/c ratio				0.33	
Merge Density				15.8	
Merge LOS				B	

Location	1	2	3	4	5



Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate Diverge Influence Area Operations					
Effective v_p (pcph)		1,415			
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FD} (Eqn 13-9)		0.720			
P_{FD} (Eqn 13-10)					
P_{FD} (Eqn 13-11)					
P_{FD}		1.000			
v_{12} (pcph)		1,415			
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)		1,415			
Diverge Speed Index		0.50			
Diverge Area Speed		55.9			
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed		55.9			
Diverge v/c ratio		0.32			
Diverge Density		14.7			
Diverge LOS		B			
Summarize Segment Operations					
Segment v/c ratio	0.29	0.32	0.27	0.33	0.32
Segment Density	10.1	14.7	9.3	15.8	11.0
Segment LOS	A	B	A	B	B
Over Capacity					

Project: **Shifler Mining and Reclamation** **Alternative:** **Cumulative Baseline Conditions**
Freeway Corridor: **Interstate 505 Northbound** **Time Period:** **AM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	952	952	580	580	600	626
On Ramp Volume				20	26	
Off Ramp Volume		372				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	952	952	580	600	626	626
PHF	0.946	0.946	0.946	0.946	0.946	0.946
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
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}	0.909	0.909	0.909	0.909	0.909	0.909
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,107	1,107	674	698	728	728
GP Flow (pcphpl)	553	553	337	349	364	364
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.23	0.23	0.14	0.15	0.15	0.15
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	7.9	7.9	4.8	5.0	5.2	5.2
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,107		675	693	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.23		0.14	0.14	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		659		698	728	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.14		0.15	0.15	

Location	1	2	3	4	5	6



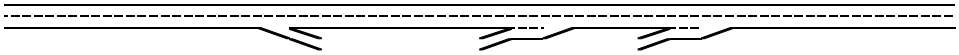
Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				20	26	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	39.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.837	
f_P				1.00	1.00	
On Flow (pcph)				23	35	
On Flow (pcphpl)				23	35	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.02	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		372				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		12.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.943				
f_P		1.00				
Off Flow (pcph)		448				
Off Flow (pcphpl)		448				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.21				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				675	693	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				675	693	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				675	693	
v_{R12a} (pcph)				698	728	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.2	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.2	
Merge v/c ratio				0.15	0.16	
Merge Density				9.5	10.0	
Merge LOS				A	B	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,107				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.712				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,107				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,107				
Diverge Speed Index		0.34				
Diverge Area Speed		60.5				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		60.5				
Diverge v/c ratio		0.25				
Diverge Density		12.2				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.23	0.25	0.14	0.15	0.16	0.15
Segment Density	7.9	12.2	4.8	9.5	10.0	5.2
Segment LOS	A	B	A	A	B	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **Cumulative Baseline Conditions**
Freeway Corridor: **Interstate 505 Southbound** **Time Period:** **AM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	650	650	624	624	875	1,115
On Ramp Volume				251	240	
Off Ramp Volume		26				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	650	650	624	875	1,115	1,115
PHF	0.904	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%
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}	0.922	0.922	0.922	0.922	0.922	0.922
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	780	780	749	1,050	1,338	1,338
GP Flow (pcphpl)	390	390	374	525	669	669
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.16	0.16	0.16	0.22	0.28	0.28
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	5.6	5.6	5.3	7.5	9.6	9.6
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		780		741	1,063	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.16		0.15	0.22	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		744		1,050	1,338	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.16		0.22	0.28	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				251	240	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				17.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.922	0.990	
f_P				1.00	1.00	
On Flow (pcph)				309	275	
On Flow (pcphpl)				309	275	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.16	0.13	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		26				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		43.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.823				
f_P		1.00				
Off Flow (pcph)		36				
Off Flow (pcphpl)		36				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.02				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				741	1,063	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				741	1,063	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				741	1,063	
v_{R12a} (pcph)				1,050	1,338	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.3	
Merge v/c ratio				0.23	0.29	
Merge Density				11.7	14.0	
Merge LOS				B	B	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		780				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.739				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		780				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		780				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.18				
Diverge Density		9.7				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.16	0.18	0.16	0.23	0.29	0.28
Segment Density	5.6	9.7	5.3	11.7	14.0	9.6
Segment LOS	A	A	A	B	B	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **Cumulative Baseline Conditions**
Freeway Corridor: **Interstate 5 Northbound** **Time Period:** **PM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	2,200	1,500	1,250	1,250	1,500	2,250
Accel Length				200	330	
Decel Length		140				
Mainline Volume	1,301	1,301	1,140	1,140	1,215	1,220
On Ramp Volume				75	5	
Off Ramp Volume		161				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	1,301	1,301	1,140	1,215	1,220	1,220
PHF	0.919	0.919	0.919	0.919	0.919	0.919
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	19.2%	19.2%	19.2%	19.2%	19.2%	19.2%
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}	0.912	0.912	0.912	0.912	0.912	0.912
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,552	1,552	1,360	1,449	1,455	1,455
GP Flow (pcphpl)	776	776	680	725	727	727
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	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.32	0.32	0.28	0.30	0.30	0.30
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	11.1	11.1	9.7	10.4	10.4	10.4
LOS	B	B	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,552		1,363	1,449	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.32		0.28	0.30	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		1,364		1,449	1,455	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.28		0.30	0.30	

Location	1	2	3	4	5	6



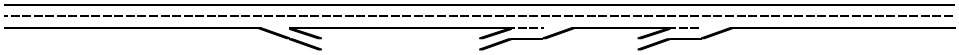
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				75	5	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				86	6	
On Flow (pcphpl)				86	6	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	25	
On Ramp Cap (pcph)				1,900	1,900	
On Ramp v/c ratio				0.05	0.00	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		161				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		4.8%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.977				
f_P		1.00				
Off Flow (pcph)		187				
Off Flow (pcphpl)		187				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		25				
Off Ramp Cap (pcph)		1,900				
Off Ramp v/c ratio		0.10				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				1,363	1,449	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.583	0.587	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				1,363	1,449	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				1,363	1,449	
v_{R12a} (pcph)				1,449	1,455	
Merge Speed Index				0.33	0.32	
Merge Area Speed				60.8	61.0	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				60.8	61.0	
Merge v/c ratio				0.32	0.32	
Merge Density				15.5	14.8	
Merge LOS				B	B	

Location	1	2	3	4	5	6



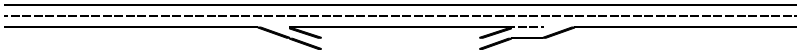
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,552				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.713				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,552				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,552				
Diverge Speed Index		0.57				
Diverge Area Speed		53.9				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		53.9				
Diverge v/c ratio		0.35				
Diverge Density		16.3				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.32	0.35	0.28	0.32	0.32	0.30
Segment Density	11.1	16.3	9.7	15.5	14.8	10.4
Segment LOS	B	B	A	B	B	A
Over Capacity						

	Project:	**Shifler Mining and Reclamation**	**Alternative:**	**Cumulative Baseline Cor**	
	Freeway Corridor:	**Interstate 5 Southbound**	**Time Period:**	**PM Peak Hour**	
Location	1	2	3	4	5



Key

<> Express Lane (HOV)

No Trucks

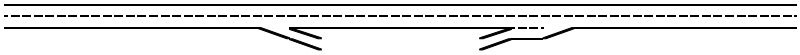
Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Define Freeway Segment					
Type	Basic	Diverge	Basic	Merge	Basic
Length (ft)	3,000	1,500	2,160	1,500	2,500
Accel Length				260	
Decel Length		190			
Mainline Volume	1,420	1,420	1,351	1,351	1,496
On Ramp Volume				145	
Off Ramp Volume		69			
Express Lane Volume					
EL On Ramp Volume					
EL Off Ramp Volume					
Calculate Flow Rate in General Purpose Lanes (GP)					
GP Volume (vph)	1,420	1,420	1,351	1,496	1,496
PHF	0.942	0.942	0.942	0.942	0.942
GP Lanes	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	20.4%	20.4%	20.4%	20.4%	20.4%
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}	0.907	0.907	0.907	0.907	0.907
f_P	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,661	1,661	1,580	1,750	1,750
GP Flow (pcphpl)	831	831	790	875	875
Calculate Speed in General Purpose Lanes					
Lane Width (ft)	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6
TRD	1.3	1.3	1.3	1.3	1.3
f_{LW}	0.0	0.0	0.0	0.0	0.0
f_{LC}	0.0	0.0	0.0	0.0	0.0
Calculated FFS	71.3	71.3	71.4	71.4	71.4
Measured FFS	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70
Calculate Operations in General Purpose Lanes					
v/c ratio	0.35	0.35	0.33	0.36	0.36
Speed (mph)	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	11.9	11.9	11.3	12.5	12.5
LOS	B	B	B	B	B
Calculate Operations for Entering GP Lanes					
GP_{IN} Vol (pcph)		1,661		1,591	
GP_{IN} Cap (pcph)		4,800		4,800	
GP_{IN} v/c ratio		0.35		0.33	
Calculate Operations for Exiting GP Lanes					
GP_{OUT} Vol (pcph)		1,579		1,750	
GP_{OUT} Cap (pcph)		4,800		4,800	
GP_{OUT} v/c ratio		0.33		0.36	

Project: Shifler Mining and Reclamation
Freeway Corridor: Interstate 5 SB

Alternative: Cumulative Baseline Conditions

Time Period: PM Peak Hour

Location	1	2	3	4	5



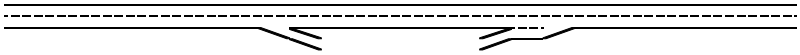
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate On Ramp Flow Rate					
On Volume (vph)				145	
PHF				0.936	
Total Lanes				1	
Terrain				Level	
Grade %				0.0%	
Grade Length (mi)				0.00	
Truck & Bus %				6.0%	
RV %				0.0%	
E_T				1.5	
E_R				1.2	
f_{HV}				0.971	
f_P				1.00	
On Flow (pcph)				160	
On Flow (pcphpl)				160	
Calculate On Ramp Roadway Operations					
On Ramp Type				Right	
On Ramp Speed (mph)				30	
On Ramp Cap (pcph)				1,900	
On Ramp v/c ratio				0.08	
Calculate Off Ramp Flow Rate					
Off Volume (vph)		69			
PHF		0.88			
Total Lanes		1			
Terrain		Level			
Grade %		0.0%			
Grade Length (mi)		0.00			
Truck & Bus %		9.1%			
RV %		0.0%			
E_T		1.5			
E_R		1.2			
f_{HV}		0.956			
f_P		1.00			
Off Flow (pcph)		82			
Off Flow (pcphpl)		82			
Calculate Off Ramp Roadway Operations					
Off Ramp Type		Right			
Off Ramp Speed		30			
Off Ramp Cap (pcph)		1,900			
Off Ramp v/c ratio		0.04			
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps					
Calculate Merge Influence Area Operations					
Effective v_P (pcph)				1,591	
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FM} (Eqn 13-3)				0.585	
P_{FM} (Eqn 13-4)					
P_{FM} (Eqn 13-5)					
P_{FM}				1.000	
v_{12} (pcph)				1,591	
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)				1,591	
v_{R12a} (pcph)				1,750	
Merge Speed Index				0.33	
Merge Area Speed				60.8	
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed				60.8	
Merge v/c ratio				0.38	
Merge Density				17.4	
Merge LOS				B	

Location	1	2	3	4	5



Key

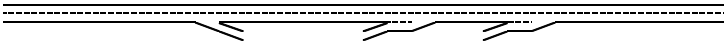
<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate Diverge Influence Area Operations					
Effective v_p (pcph)		1,661			
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FD} (Eqn 13-9)		0.715			
P_{FD} (Eqn 13-10)					
P_{FD} (Eqn 13-11)					
P_{FD}		1.000			
v_{12} (pcph)		1,661			
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)		1,661			
Diverge Speed Index		0.50			
Diverge Area Speed		56.0			
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed		56.0			
Diverge v/c ratio		0.38			
Diverge Density		16.8			
Diverge LOS		B			
Summarize Segment Operations					
Segment v/c ratio	0.35	0.38	0.33	0.38	0.36
Segment Density	11.9	16.8	11.3	17.4	12.5
Segment LOS	B	B	B	B	B
Over Capacity					

Project: Shifler Mining and Reclamation **Alternative:** Cumulative Baseline Conditions
Freeway Corridor: Interstate 505 Northbound **Time Period:** PM Peak Hour

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	1,083	1,083	492	492	512	532
On Ramp Volume				20	20	
Off Ramp Volume		591				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	1,083	1,083	492	512	532	532
PHF	0.939	0.939	0.939	0.939	0.939	0.939
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	7.7%	7.7%	7.7%	7.7%	7.7%	7.7%
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}	0.963	0.963	0.963	0.963	0.963	0.963
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,198	1,198	544	566	588	588
GP Flow (pcphpl)	599	599	272	283	294	294
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.25	0.25	0.11	0.12	0.12	0.12
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	8.6	8.6	3.9	4.0	4.2	4.2
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,198		542	565	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.25		0.11	0.12	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		544		566	588	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.11		0.12	0.12	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				20	20	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				11.8%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.944	0.990	
f_p				1.00	1.00	
On Flow (pcph)				24	23	
On Flow (pcphpl)				24	23	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.01	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		591				
PHF		0.913				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		2.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.990				
f_p		1.00				
Off Flow (pcph)		654				
Off Flow (pcphpl)		654				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.31				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_p (pcph)				542	565	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				542	565	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				542	565	
v_{R12a} (pcph)				566	588	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.3	
Merge v/c ratio				0.12	0.13	
Merge Density				8.5	8.9	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,198				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.700				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,198				
v_5 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,198				
Diverge Speed Index		0.36				
Diverge Area Speed		60.0				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		60.0				
Diverge v/c ratio		0.27				
Diverge Density		13.0				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.25	0.27	0.11	0.12	0.13	0.12
Segment Density	8.6	13.0	3.9	8.5	8.9	4.2
Segment LOS	A	B	A	A	A	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **Cumulative Baseline Conditions**
Freeway Corridor: **Interstate 505 Southbound** **Time Period:** **PM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	562	562	552	552	708	1,028
On Ramp Volume				156	320	
Off Ramp Volume		10				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	562	562	552	708	1,028	1,028
PHF	0.886	0.886	0.886	0.886	0.886	0.886
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%
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}	0.952	0.952	0.952	0.952	0.952	0.952
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	666	666	654	839	1,219	1,219
GP Flow (pcphpl)	333	333	327	420	609	609
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.14	0.14	0.14	0.17	0.25	0.25
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	4.8	4.8	4.7	6.0	8.7	8.7
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		666		660	852	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.14		0.14	0.18	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		654		839	1,219	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.14		0.17	0.25	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				156	320	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				179	367	
On Flow (pcphpl)				179	367	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.09	0.17	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		10				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		20.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.909				
f_P		1.00				
Off Flow (pcph)		13				
Off Flow (pcphpl)		13				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.01				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				660	852	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				660	852	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				660	852	
v_{R12a} (pcph)				839	1,219	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.2	61.4	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.2	61.4	
Merge v/c ratio				0.18	0.26	
Merge Density				10.1	13.0	
Merge LOS				B	B	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		666				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.743				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		666				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		666				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.15				
Diverge Density		8.7				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.14	0.15	0.14	0.18	0.26	0.25
Segment Density	4.8	8.7	4.7	10.1	13.0	8.7
Segment LOS	A	A	A	B	B	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **C+P Conditions (Scenario 2)**
Freeway Corridor: **Interstate 505 Northbound** **Time Period:** **AM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	983	983	608	608	628	653
On Ramp Volume				20	25	
Off Ramp Volume		375				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	983	983	608	628	653	653
PHF	0.946	0.946	0.946	0.946	0.946	0.946
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%
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}	0.905	0.905	0.905	0.905	0.905	0.905
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,148	1,148	710	734	763	763
GP Flow (pcphpl)	574	574	355	367	381	381
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.24	0.24	0.15	0.15	0.16	0.16
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	8.2	8.2	5.1	5.2	5.4	5.4
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,148		711	728	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.24		0.15	0.15	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		692		734	763	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.14		0.15	0.16	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				20	25	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	44.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.820	
f_P				1.00	1.00	
On Flow (pcph)				23	35	
On Flow (pcphpl)				23	35	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.02	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		375				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		14.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.935				
f_P		1.00				
Off Flow (pcph)		456				
Off Flow (pcphpl)		456				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.22				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				711	728	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				711	728	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				711	728	
v_{R12a} (pcph)				734	763	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.2	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.2	
Merge v/c ratio				0.16	0.17	
Merge Density				9.8	10.3	
Merge LOS				A	B	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,148				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.710				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,148				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,148				
Diverge Speed Index		0.34				
Diverge Area Speed		60.5				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		60.5				
Diverge v/c ratio		0.26				
Diverge Density		12.6				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.24	0.26	0.15	0.16	0.17	0.16
Segment Density	8.2	12.6	5.1	9.8	10.3	5.4
Segment LOS	A	B	A	A	B	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **C+P Conditions (Scenario 2)**
Freeway Corridor: **Interstate 505 Southbound** **Time Period:** **AM Peak Hour**



Key
<> Express Lane (HOV)
No Trucks

Location	1	2	3	4	5	6
Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	635	635	610	610	864	1,104
On Ramp Volume				254	240	
Off Ramp Volume		25				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	635	635	610	864	1,104	1,104
PHF	0.904	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%
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}	0.922	0.922	0.922	0.922	0.922	0.922
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	762	762	732	1,037	1,325	1,325
GP Flow (pcphpl)	381	381	366	518	663	663
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.16	0.16	0.15	0.22	0.28	0.28
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	5.4	5.4	5.2	7.4	9.5	9.5
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		762		719	1,050	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.16		0.15	0.22	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		727		1,037	1,325	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.15		0.22	0.28	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				254	240	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				20.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.909	0.990	
f_P				1.00	1.00	
On Flow (pcph)				318	275	
On Flow (pcphpl)				318	275	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.17	0.13	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		25				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		48.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.806				
f_P		1.00				
Off Flow (pcph)		35				
Off Flow (pcphpl)		35				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.02				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				719	1,050	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				719	1,050	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				719	1,050	
v_{R12a} (pcph)				1,037	1,325	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.3	
Merge v/c ratio				0.23	0.29	
Merge Density				11.6	13.9	
Merge LOS				B	B	

Location	1	2	3	4	5	6



Key

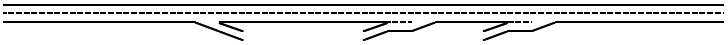
<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		762				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.739				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		762				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		762				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.17				
Diverge Density		9.5				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.16	0.17	0.15	0.23	0.29	0.28
Segment Density	5.4	9.5	5.2	11.6	13.9	9.5
Segment LOS	A	A	A	B	B	A
Over Capacity						

Project: Shifler Mining and Reclamation **Alternative:** C+P Conditions (Scenario 2)
Freeway Corridor: Interstate 505 Northbound **Time Period:** PM Peak Hour

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	1,083	1,083	492	492	512	532
On Ramp Volume				20	20	
Off Ramp Volume		591				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	1,083	1,083	492	512	532	532
PHF	0.939	0.939	0.939	0.939	0.939	0.939
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	7.7%	7.7%	7.7%	7.7%	7.7%	7.7%
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}	0.963	0.963	0.963	0.963	0.963	0.963
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,198	1,198	544	566	588	588
GP Flow (pcphpl)	599	599	272	283	294	294
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.25	0.25	0.11	0.12	0.12	0.12
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	8.6	8.6	3.9	4.0	4.2	4.2
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,198		542	565	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.25		0.11	0.12	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		544		566	588	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.11		0.12	0.12	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				20	20	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				11.8%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.944	0.990	
f_p				1.00	1.00	
On Flow (pcph)				24	23	
On Flow (pcphpl)				24	23	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.01	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		591				
PHF		0.913				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		2.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.990				
f_p		1.00				
Off Flow (pcph)		654				
Off Flow (pcphpl)		654				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.31				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_p (pcph)				542	565	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				542	565	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				542	565	
v_{R12a} (pcph)				566	588	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.3	
Merge v/c ratio				0.12	0.13	
Merge Density				8.5	8.9	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,198				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.700				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,198				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,198				
Diverge Speed Index		0.36				
Diverge Area Speed		60.0				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		60.0				
Diverge v/c ratio		0.27				
Diverge Density		13.0				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.25	0.27	0.11	0.12	0.13	0.12
Segment Density	8.6	13.0	3.9	8.5	8.9	4.2
Segment LOS	A	B	A	A	A	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **C+P Conditions (Scenario 2)**
Freeway Corridor: **Interstate 505 Southbound** **Time Period:** **PM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	561	561	551	551	707	1,027
On Ramp Volume				156	320	
Off Ramp Volume		10				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	561	561	551	707	1,027	1,027
PHF	0.886	0.886	0.886	0.886	0.886	0.886
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%
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}	0.952	0.952	0.952	0.952	0.952	0.952
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	665	665	653	838	1,218	1,218
GP Flow (pcphpl)	333	333	327	419	609	609
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.14	0.14	0.14	0.17	0.25	0.25
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	4.8	4.8	4.7	6.0	8.7	8.7
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		665		659	850	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.14		0.14	0.18	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		653		838	1,218	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.14		0.17	0.25	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				156	320	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				179	367	
On Flow (pcphpl)				179	367	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.09	0.17	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		10				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		20.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.909				
f_P		1.00				
Off Flow (pcph)		13				
Off Flow (pcphpl)		13				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.01				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				659	850	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				659	850	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				659	850	
v_{R12a} (pcph)				838	1,218	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.2	61.4	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.2	61.4	
Merge v/c ratio				0.18	0.26	
Merge Density				10.1	13.0	
Merge LOS				B	B	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		665				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.743				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		665				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		665				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.15				
Diverge Density		8.7				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.14	0.15	0.14	0.18	0.26	0.25
Segment Density	4.8	8.7	4.7	10.1	13.0	8.7
Segment LOS	A	A	A	B	B	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **C+P Conditions (Scenario 3)**
Freeway Corridor: **Interstate 505 Northbound** **Time Period:** **AM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	974	974	596	596	616	641
On Ramp Volume				20	25	
Off Ramp Volume		378				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	974	974	596	616	641	641
PHF	0.946	0.946	0.946	0.946	0.946	0.946
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%
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}	0.905	0.905	0.905	0.905	0.905	0.905
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,138	1,138	696	720	749	749
GP Flow (pcphpl)	569	569	348	360	374	374
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.24	0.24	0.15	0.15	0.16	0.16
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	8.1	8.1	5.0	5.1	5.3	5.3
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,138		697	714	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.24		0.15	0.15	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		678		720	749	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.14		0.15	0.16	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				20	25	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	44.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.820	
f_P				1.00	1.00	
On Flow (pcph)				23	35	
On Flow (pcphpl)				23	35	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.02	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		378				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		14.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.935				
f_P		1.00				
Off Flow (pcph)		460				
Off Flow (pcphpl)		460				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.22				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				697	714	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				697	714	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				697	714	
v_{R12a} (pcph)				720	749	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.2	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.2	
Merge v/c ratio				0.16	0.16	
Merge Density				9.7	10.2	
Merge LOS				A	B	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,138				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.710				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,138				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,138				
Diverge Speed Index		0.34				
Diverge Area Speed		60.5				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		60.5				
Diverge v/c ratio		0.26				
Diverge Density		12.5				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.24	0.26	0.15	0.16	0.16	0.16
Segment Density	8.1	12.5	5.0	9.7	10.2	5.3
Segment LOS	A	B	A	A	B	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **C+P Conditions (Scenario 3)**
Freeway Corridor: **Interstate 505 Southbound** **Time Period:** **AM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	622	622	597	597	854	1,094
On Ramp Volume				257	240	
Off Ramp Volume		25				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	622	622	597	854	1,094	1,094
PHF	0.904	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%
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}	0.922	0.922	0.922	0.922	0.922	0.922
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	747	747	717	1,025	1,313	1,313
GP Flow (pcphpl)	373	373	358	512	657	657
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.16	0.16	0.15	0.21	0.27	0.27
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	5.3	5.3	5.1	7.3	9.4	9.4
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		747		704	1,038	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.16		0.15	0.22	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		711		1,025	1,313	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.15		0.21	0.27	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				257	240	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				20.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.909	0.990	
f_P				1.00	1.00	
On Flow (pcph)				321	275	
On Flow (pcphpl)				321	275	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.17	0.13	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		25				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		48.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.806				
f_P		1.00				
Off Flow (pcph)		35				
Off Flow (pcphpl)		35				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.02				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				704	1,038	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				704	1,038	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				704	1,038	
v_{R12a} (pcph)				1,025	1,313	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.3	
Merge v/c ratio				0.22	0.29	
Merge Density				11.5	13.8	
Merge LOS				B	B	

Location	1	2	3	4	5	6



Key

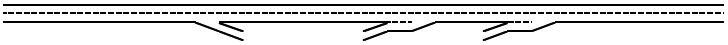
<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		747				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.740				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		747				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		747				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.17				
Diverge Density		9.4				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.16	0.17	0.15	0.22	0.29	0.27
Segment Density	5.3	9.4	5.1	11.5	13.8	9.4
Segment LOS	A	A	A	B	B	A
Over Capacity						

Project: Shifler Mining and Reclamation **Alternative:** C+P Conditions (Scenario 3)
Freeway Corridor: Interstate 505 Northbound **Time Period:** PM Peak Hour

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	1,082	1,082	491	491	511	531
On Ramp Volume				20	20	
Off Ramp Volume		591				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	1,082	1,082	491	511	531	531
PHF	0.939	0.939	0.939	0.939	0.939	0.939
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	7.7%	7.7%	7.7%	7.7%	7.7%	7.7%
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}	0.963	0.963	0.963	0.963	0.963	0.963
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,197	1,197	543	565	587	587
GP Flow (pcphpl)	598	598	272	283	294	294
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.25	0.25	0.11	0.12	0.12	0.12
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	8.5	8.5	3.9	4.0	4.2	4.2
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,197		541	564	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.25		0.11	0.12	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		543		565	587	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.11		0.12	0.12	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				20	20	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				11.8%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.944	0.990	
f_p				1.00	1.00	
On Flow (pcph)				24	23	
On Flow (pcphpl)				24	23	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.01	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		591				
PHF		0.913				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		2.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.990				
f_p		1.00				
Off Flow (pcph)		654				
Off Flow (pcphpl)		654				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.31				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_p (pcph)				541	564	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				541	564	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				541	564	
v_{R12a} (pcph)				565	587	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.3	
Merge v/c ratio				0.12	0.13	
Merge Density				8.5	8.9	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,197				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.700				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,197				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,197				
Diverge Speed Index		0.36				
Diverge Area Speed		60.0				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		60.0				
Diverge v/c ratio		0.27				
Diverge Density		13.0				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.25	0.27	0.11	0.12	0.13	0.12
Segment Density	8.5	13.0	3.9	8.5	8.9	4.2
Segment LOS	A	B	A	A	A	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **C+P Conditions (Scenario 3)**
Freeway Corridor: **Interstate 505 Southbound** **Time Period:** **PM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	561	561	551	551	707	1,027
On Ramp Volume				156	320	
Off Ramp Volume		10				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	561	561	551	707	1,027	1,027
PHF	0.886	0.886	0.886	0.886	0.886	0.886
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%
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}	0.952	0.952	0.952	0.952	0.952	0.952
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	665	665	653	838	1,218	1,218
GP Flow (pcphpl)	333	333	327	419	609	609
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.14	0.14	0.14	0.17	0.25	0.25
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	4.8	4.8	4.7	6.0	8.7	8.7
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		665		659	850	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.14		0.14	0.18	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		653		838	1,218	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.14		0.17	0.25	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				156	320	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				179	367	
On Flow (pcphpl)				179	367	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.09	0.17	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		10				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		20.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.909				
f_P		1.00				
Off Flow (pcph)		13				
Off Flow (pcphpl)		13				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.01				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				659	850	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				659	850	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				659	850	
v_{R12a} (pcph)				838	1,218	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.2	61.4	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.2	61.4	
Merge v/c ratio				0.18	0.26	
Merge Density				10.1	13.0	
Merge LOS				B	B	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		665				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.743				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		665				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		665				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.15				
Diverge Density		8.7				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.14	0.15	0.14	0.18	0.26	0.25
Segment Density	4.8	8.7	4.7	10.1	13.0	8.7
Segment LOS	A	A	A	B	B	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **C+P Conditions (Scenario 4)**
Freeway Corridor: **Interstate 5 Northbound** **Time Period:** **AM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	2,200	1,500	1,250	1,250	1,500	2,250
Accel Length				200	330	
Decel Length		140				
Mainline Volume	1,344	1,344	1,155	1,155	1,209	1,214
On Ramp Volume				54	5	
Off Ramp Volume		189				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	1,344	1,344	1,155	1,209	1,214	1,214
PHF	0.88	0.88	0.88	0.88	0.88	0.88
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%
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}	0.851	0.851	0.851	0.851	0.851	0.851
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,795	1,795	1,542	1,614	1,621	1,621
GP Flow (pcphpl)	897	897	771	807	810	810
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	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.37	0.37	0.32	0.34	0.34	0.34
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	12.8	12.8	11.0	11.5	11.6	11.6
LOS	B	B	B	B	B	B
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,795		1,548	1,615	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.37		0.32	0.34	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		1,539		1,614	1,621	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.32		0.34	0.34	

Location	1	2	3	4	5	6



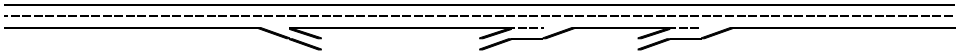
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				54	5	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				15.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.930	0.990	
f_P				1.00	1.00	
On Flow (pcph)				66	6	
On Flow (pcphpl)				66	6	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	25	
On Ramp Cap (pcph)				1,900	1,900	
On Ramp v/c ratio				0.03	0.00	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		189				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		38.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.840				
f_P		1.00				
Off Flow (pcph)		256				
Off Flow (pcphpl)		256				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		25				
Off Ramp Cap (pcph)		1,900				
Off Ramp v/c ratio		0.13				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				1,548	1,615	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.583	0.587	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				1,548	1,615	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				1,548	1,615	
v_{R12a} (pcph)				1,614	1,621	
Merge Speed Index				0.33	0.32	
Merge Area Speed				60.7	60.9	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				60.7	60.9	
Merge v/c ratio				0.35	0.35	
Merge Density				16.8	16.0	
Merge LOS				B	B	

Location	1	2	3	4	5	6



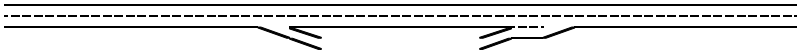
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,795				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.703				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,795				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,795				
Diverge Speed Index		0.58				
Diverge Area Speed		53.7				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		53.7				
Diverge v/c ratio		0.41				
Diverge Density		18.4				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.37	0.41	0.32	0.35	0.35	0.34
Segment Density	12.8	18.4	11.0	16.8	16.0	11.6
Segment LOS	B	B	B	B	B	B
Over Capacity						

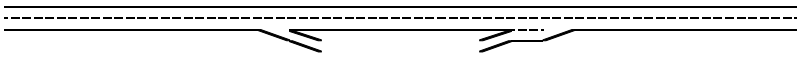
	Project:	**Shifler Mining and Reclamation**	**Alternative:**	**C+P Conditions (Scenari**	
	Freeway Corridor:	**Interstate 5 Southbound**	**Time Period:**	**AM Peak Hour**	
Location	1	2	3	4	5



Key
<> Express Lane (HOV)
No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Define Freeway Segment					
Type	Basic	Diverge	Basic	Merge	Basic
Length (ft)	3,000	1,500	2,160	1,500	2,500
Accel Length				260	
Decel Length		190			
Mainline Volume	1,154	1,154	1,064	1,064	1,283
On Ramp Volume				219	
Off Ramp Volume		90			
Express Lane Volume					
EL On Ramp Volume					
EL Off Ramp Volume					
Calculate Flow Rate in General Purpose Lanes (GP)					
GP Volume (vph)	1,154	1,154	1,064	1,283	1,283
PHF	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	22.0%	22.0%	22.0%	22.0%	22.0%
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}	0.901	0.901	0.901	0.901	0.901
f_P	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,417	1,417	1,306	1,575	1,575
GP Flow (pcphpl)	708	708	653	788	788
Calculate Speed in General Purpose Lanes					
Lane Width (ft)	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6
TRD	1.3	1.3	1.3	1.3	1.3
f_{LW}	0.0	0.0	0.0	0.0	0.0
f_{LC}	0.0	0.0	0.0	0.0	0.0
Calculated FFS	71.3	71.3	71.4	71.4	71.4
Measured FFS	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70
Calculate Operations in General Purpose Lanes					
v/c ratio	0.30	0.30	0.27	0.33	0.33
Speed (mph)	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	10.1	10.1	9.3	11.3	11.3
LOS	A	A	A	B	B
Calculate Operations for Entering GP Lanes					
GP_{IN} Vol (pcph)		1,417		1,280	
GP_{IN} Cap (pcph)		4,800		4,800	
GP_{IN} v/c ratio		0.30		0.27	
Calculate Operations for Exiting GP Lanes					
GP_{OUT} Vol (pcph)		1,311		1,575	
GP_{OUT} Cap (pcph)		4,800		4,800	
GP_{OUT} v/c ratio		0.27		0.33	

Location	1	2	3	4	5



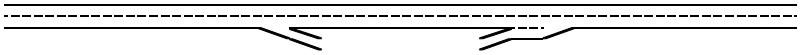
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate On Ramp Flow Rate					
On Volume (vph)				219	
PHF				0.88	
Total Lanes				1	
Terrain				Level	
Grade %				0.0%	
Grade Length (mi)				0.00	
Truck & Bus %				37.0%	
RV %				0.0%	
E_T				1.5	
E_R				1.2	
f_{HV}				0.844	
f_P				1.00	
On Flow (pcph)				295	
On Flow (pcphpl)				295	
Calculate On Ramp Roadway Operations					
On Ramp Type				Right	
On Ramp Speed (mph)				30	
On Ramp Cap (pcph)				1,900	
On Ramp v/c ratio				0.16	
Calculate Off Ramp Flow Rate					
Off Volume (vph)		90			
PHF		0.88			
Total Lanes		1			
Terrain		Level			
Grade %		0.0%			
Grade Length (mi)		0.00			
Truck & Bus %		7.0%			
RV %		0.0%			
E_T		1.5			
E_R		1.2			
f_{HV}		0.966			
f_P		1.00			
Off Flow (pcph)		106			
Off Flow (pcphpl)		106			
Calculate Off Ramp Roadway Operations					
Off Ramp Type		Right			
Off Ramp Speed		30			
Off Ramp Cap (pcph)		1,900			
Off Ramp v/c ratio		0.06			
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps					
Calculate Merge Influence Area Operations					
Effective v_P (pcph)				1,280	
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FM} (Eqn 13-3)				0.585	
P_{FM} (Eqn 13-4)					
P_{FM} (Eqn 13-5)					
P_{FM}				1.000	
v_{12} (pcph)				1,280	
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)				1,280	
v_{R12a} (pcph)				1,575	
Merge Speed Index				0.32	
Merge Area Speed				60.9	
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed				60.9	
Merge v/c ratio				0.34	
Merge Density				16.0	
Merge LOS				B	

Location	1	2	3	4	5



Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate Diverge Influence Area Operations					
Effective v_p (pcph)		1,417			
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FD} (Eqn 13-9)		0.720			
P_{FD} (Eqn 13-10)					
P_{FD} (Eqn 13-11)					
P_{FD}		1.000			
v_{12} (pcph)		1,417			
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)		1,417			
Diverge Speed Index		0.50			
Diverge Area Speed		55.9			
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed		55.9			
Diverge v/c ratio		0.32			
Diverge Density		14.7			
Diverge LOS		B			
Summarize Segment Operations					
Segment v/c ratio	0.30	0.32	0.27	0.34	0.33
Segment Density	10.1	14.7	9.3	16.0	11.3
Segment LOS	A	B	A	B	B
Over Capacity					

Project: **Shifler Mining and Reclamation** **Alternative:** **C+P Conditions (Scenario 4)**
Freeway Corridor: **Interstate 505 Northbound** **Time Period:** **AM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	961	961	580	580	600	625
On Ramp Volume				20	25	
Off Ramp Volume		381				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	961	961	580	600	625	625
PHF	0.946	0.946	0.946	0.946	0.946	0.946
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%
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}	0.905	0.905	0.905	0.905	0.905	0.905
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,123	1,123	677	701	730	730
GP Flow (pcphpl)	561	561	339	350	365	365
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.23	0.23	0.14	0.15	0.15	0.15
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	8.0	8.0	4.8	5.0	5.2	5.2
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,123		678	695	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.23		0.14	0.14	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		659		701	730	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.14		0.15	0.15	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				20	25	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	44.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.820	
f_P				1.00	1.00	
On Flow (pcph)				23	35	
On Flow (pcphpl)				23	35	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.02	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		381				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		14.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.935				
f_P		1.00				
Off Flow (pcph)		463				
Off Flow (pcphpl)		463				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.22				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				678	695	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				678	695	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				678	695	
v_{R12a} (pcph)				701	730	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.2	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.2	
Merge v/c ratio				0.15	0.16	
Merge Density				9.6	10.0	
Merge LOS				A	B	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,123				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.711				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,123				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,123				
Diverge Speed Index		0.34				
Diverge Area Speed		60.5				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		60.5				
Diverge v/c ratio		0.26				
Diverge Density		12.4				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.23	0.26	0.14	0.15	0.16	0.15
Segment Density	8.0	12.4	4.8	9.6	10.0	5.2
Segment LOS	A	B	A	A	B	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **C+P Conditions (Scenario 4)**
Freeway Corridor: **Interstate 505 Southbound** **Time Period:** **AM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	605	605	580	580	840	1,080
On Ramp Volume				260	240	
Off Ramp Volume		25				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	605	605	580	840	1,080	1,080
PHF	0.904	0.904	0.904	0.904	0.904	0.904
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%
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}	0.922	0.922	0.922	0.922	0.922	0.922
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	726	726	696	1,008	1,296	1,296
GP Flow (pcphpl)	363	363	348	504	648	648
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.15	0.15	0.15	0.21	0.27	0.27
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	5.2	5.2	5.0	7.2	9.3	9.3
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		726		683	1,021	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.15		0.14	0.21	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		691		1,008	1,296	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.14		0.21	0.27	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				260	240	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				20.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.909	0.990	
f_P				1.00	1.00	
On Flow (pcph)				325	275	
On Flow (pcphpl)				325	275	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.17	0.13	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		25				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		48.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.806				
f_P		1.00				
Off Flow (pcph)		35				
Off Flow (pcphpl)		35				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.02				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				683	1,021	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				683	1,021	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				683	1,021	
v_{R12a} (pcph)				1,008	1,296	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.3	
Merge v/c ratio				0.22	0.28	
Merge Density				11.4	13.6	
Merge LOS				B	B	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		726				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.740				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		726				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		726				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.17				
Diverge Density		9.2				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.15	0.17	0.15	0.22	0.28	0.27
Segment Density	5.2	9.2	5.0	11.4	13.6	9.3
Segment LOS	A	A	A	B	B	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **C+P Conditions (Scenario 4)**
Freeway Corridor: **Interstate 5 Northbound** **Time Period:** **PM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	2,200	1,500	1,250	1,250	1,500	2,250
Accel Length				200	330	
Decel Length		140				
Mainline Volume	1,303	1,303	1,140	1,140	1,215	1,220
On Ramp Volume				75	5	
Off Ramp Volume		163				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	1,303	1,303	1,140	1,215	1,220	1,220
PHF	0.919	0.919	0.919	0.919	0.919	0.919
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	19.3%	19.3%	19.3%	19.3%	19.3%	19.3%
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}	0.912	0.912	0.912	0.912	0.912	0.912
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,555	1,555	1,360	1,450	1,456	1,456
GP Flow (pcphpl)	777	777	680	725	728	728
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	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.32	0.32	0.28	0.30	0.30	0.30
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	11.1	11.1	9.7	10.4	10.4	10.4
LOS	B	B	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,555		1,364	1,450	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.32		0.28	0.30	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		1,365		1,450	1,456	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.28		0.30	0.30	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				75	5	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				86	6	
On Flow (pcphpl)				86	6	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	25	
On Ramp Cap (pcph)				1,900	1,900	
On Ramp v/c ratio				0.05	0.00	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		163				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		4.8%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.977				
f_P		1.00				
Off Flow (pcph)		190				
Off Flow (pcphpl)		190				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		25				
Off Ramp Cap (pcph)		1,900				
Off Ramp v/c ratio		0.10				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				1,364	1,450	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.583	0.587	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				1,364	1,450	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				1,364	1,450	
v_{R12a} (pcph)				1,450	1,456	
Merge Speed Index				0.33	0.32	
Merge Area Speed				60.8	61.0	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				60.8	61.0	
Merge v/c ratio				0.32	0.32	
Merge Density				15.5	14.8	
Merge LOS				B	B	

Location	1	2	3	4	5	6



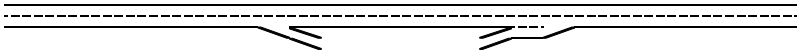
Key

<> Express Lane (HOV)

No Trucks

Name	I5 South of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I5 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,555				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.712				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,555				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,555				
Diverge Speed Index		0.58				
Diverge Area Speed		53.9				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		53.9				
Diverge v/c ratio		0.35				
Diverge Density		16.4				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.32	0.35	0.28	0.32	0.32	0.30
Segment Density	11.1	16.4	9.7	15.5	14.8	10.4
Segment LOS	B	B	A	B	B	A
Over Capacity						

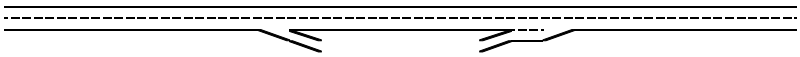
	Project:	**Shifler Mining and Reclamation**	**Alternative:**	**C+P Conditions (Scenari**	
	Freeway Corridor:	**Interstate 5 Southbound**	**Time Period:**	**PM Peak Hour**	
Location	1	2	3	4	5



Key
<> Express Lane (HOV)
No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Define Freeway Segment					
Type	Basic	Diverge	Basic	Merge	Basic
Length (ft)	3,000	1,500	2,160	1,500	2,500
Accel Length				260	
Decel Length		190			
Mainline Volume	1,420	1,420	1,351	1,351	1,498
On Ramp Volume				147	
Off Ramp Volume		69			
Express Lane Volume					
EL On Ramp Volume					
EL Off Ramp Volume					
Calculate Flow Rate in General Purpose Lanes (GP)					
GP Volume (vph)	1,420	1,420	1,351	1,498	1,498
PHF	0.942	0.942	0.942	0.942	0.942
GP Lanes	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	20.4%	20.4%	20.4%	20.4%	20.4%
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}	0.907	0.907	0.907	0.907	0.907
f_P	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,661	1,661	1,580	1,752	1,752
GP Flow (pcphpl)	831	831	790	876	876
Calculate Speed in General Purpose Lanes					
Lane Width (ft)	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6
TRD	1.3	1.3	1.3	1.3	1.3
f_{LW}	0.0	0.0	0.0	0.0	0.0
f_{LC}	0.0	0.0	0.0	0.0	0.0
Calculated FFS	71.3	71.3	71.4	71.4	71.4
Measured FFS	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70
Calculate Operations in General Purpose Lanes					
v/c ratio	0.35	0.35	0.33	0.37	0.37
Speed (mph)	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	11.9	11.9	11.3	12.5	12.5
LOS	B	B	B	B	B
Calculate Operations for Entering GP Lanes					
GP_{IN} Vol (pcph)		1,661		1,590	
GP_{IN} Cap (pcph)		4,800		4,800	
GP_{IN} v/c ratio		0.35		0.33	
Calculate Operations for Exiting GP Lanes					
GP_{OUT} Vol (pcph)		1,579		1,752	
GP_{OUT} Cap (pcph)		4,800		4,800	
GP_{OUT} v/c ratio		0.33		0.37	

Location	1	2	3	4	5



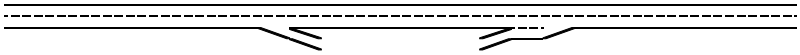
Key

<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate On Ramp Flow Rate					
On Volume (vph)				147	
PHF				0.936	
Total Lanes				1	
Terrain				Level	
Grade %				0.0%	
Grade Length (mi)				0.00	
Truck & Bus %				7.0%	
RV %				0.0%	
E_T				1.5	
E_R				1.2	
f_{HV}				0.966	
f_P				1.00	
On Flow (pcph)				163	
On Flow (pcphpl)				163	
Calculate On Ramp Roadway Operations					
On Ramp Type				Right	
On Ramp Speed (mph)				30	
On Ramp Cap (pcph)				1,900	
On Ramp v/c ratio				0.09	
Calculate Off Ramp Flow Rate					
Off Volume (vph)		69			
PHF		0.88			
Total Lanes		1			
Terrain		Level			
Grade %		0.0%			
Grade Length (mi)		0.00			
Truck & Bus %		9.1%			
RV %		0.0%			
E_T		1.5			
E_R		1.2			
f_{HV}		0.956			
f_P		1.00			
Off Flow (pcph)		82			
Off Flow (pcphpl)		82			
Calculate Off Ramp Roadway Operations					
Off Ramp Type		Right			
Off Ramp Speed		30			
Off Ramp Cap (pcph)		1,900			
Off Ramp v/c ratio		0.04			
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps					
Calculate Merge Influence Area Operations					
Effective v_P (pcph)				1,590	
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FM} (Eqn 13-3)				0.585	
P_{FM} (Eqn 13-4)					
P_{FM} (Eqn 13-5)					
P_{FM}				1.000	
v_{12} (pcph)				1,590	
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)				1,590	
v_{R12a} (pcph)				1,752	
Merge Speed Index				0.33	
Merge Area Speed				60.8	
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed				60.8	
Merge v/c ratio				0.38	
Merge Density				17.4	
Merge LOS				B	

Location	1	2	3	4	5



Key

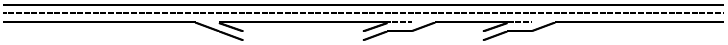
<> Express Lane (HOV)

No Trucks

Name	I5 North of SR 16	SR 16 Off Ramp	I5 between SR 16 Ramp	SR 16 On Ramp	I5 South of SR 16
Calculate Diverge Influence Area Operations					
Effective v_p (pcph)		1,661			
Up Ramp L_{EQ}					
Down Ramp L_{EQ}					
P_{FD} (Eqn 13-9)		0.715			
P_{FD} (Eqn 13-10)					
P_{FD} (Eqn 13-11)					
P_{FD}		1.000			
v_{12} (pcph)		1,661			
v_3 (pcph)					
v_{34} (pcph)					
v_{12a} (pcph)		1,661			
Diverge Speed Index		0.50			
Diverge Area Speed		56.0			
Outer Lanes Volume					
Outer Lanes Speed					
Segment Speed		56.0			
Diverge v/c ratio		0.38			
Diverge Density		16.8			
Diverge LOS		B			
Summarize Segment Operations					
Segment v/c ratio	0.35	0.38	0.33	0.38	0.37
Segment Density	11.9	16.8	11.3	17.4	12.5
Segment LOS	B	B	B	B	B
Over Capacity					

Project: Shifler Mining and Reclamation **Alternative:** C+P Conditions (Scenario 4)
Freeway Corridor: Interstate 505 Northbound **Time Period:** PM Peak Hour

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	15,730	1,500	1,730	1,330	1,500	8,740
Accel Length				220	180	
Decel Length		170				
Mainline Volume	1,081	1,081	490	490	510	530
On Ramp Volume				20	20	
Off Ramp Volume		591				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	1,081	1,081	490	510	530	530
PHF	0.939	0.939	0.939	0.939	0.939	0.939
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	7.7%	7.7%	7.7%	7.7%	7.7%	7.7%
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}	0.963	0.963	0.963	0.963	0.963	0.963
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	1,196	1,196	542	564	586	586
GP Flow (pcphpl)	598	598	271	282	293	293
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.6
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.25	0.25	0.11	0.12	0.12	0.12
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	8.5	8.5	3.9	4.0	4.2	4.2
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		1,196		540	563	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.25		0.11	0.12	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		542		564	586	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.11		0.12	0.12	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				20	20	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				11.8%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.944	0.990	
f_p				1.00	1.00	
On Flow (pcph)				24	23	
On Flow (pcphpl)				24	23	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.01	0.01	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		591				
PHF		0.913				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		2.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.990				
f_p		1.00				
Off Flow (pcph)		654				
Off Flow (pcphpl)		654				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.31				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_p (pcph)				540	563	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.584	0.583	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				540	563	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				540	563	
v_{R12a} (pcph)				564	586	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.1	61.3	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.1	61.3	
Merge v/c ratio				0.12	0.13	
Merge Density				8.5	8.9	
Merge LOS				A	A	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 South of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 North of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		1,196				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.700				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		1,196				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		1,196				
Diverge Speed Index		0.36				
Diverge Area Speed		60.0				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		60.0				
Diverge v/c ratio		0.27				
Diverge Density		13.0				
Diverge LOS		B				
Summarize Segment Operations						
Segment v/c ratio	0.25	0.27	0.11	0.12	0.13	0.12
Segment Density	8.5	13.0	3.9	8.5	8.9	4.2
Segment LOS	A	B	A	A	A	A
Over Capacity						

Project: **Shifler Mining and Reclamation** **Alternative:** **C+P Conditions (Scenario 4)**
Freeway Corridor: **Interstate 505 Southbound** **Time Period:** **PM Peak Hour**

Location	1	2	3	4	5	6



Key
<> Express Lane (HOV)
No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Define Freeway Segment						
Type	Basic	Diverge	Basic	Merge	Merge	Basic
Length (ft)	9,090	1,500	1,700	1,180	1,500	16,010
Accel Length				290	290	
Decel Length		140				
Mainline Volume	560	560	550	550	706	1,026
On Ramp Volume				156	320	
Off Ramp Volume		10				
Express Lane Volume						
EL On Ramp Volume						
EL Off Ramp Volume						
Calculate Flow Rate in General Purpose Lanes (GP)						
GP Volume (vph)	560	560	550	706	1,026	1,026
PHF	0.886	0.886	0.886	0.886	0.886	0.886
GP Lanes	2	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	10.1%	10.1%	10.1%	10.1%	10.1%	10.1%
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}	0.952	0.952	0.952	0.952	0.952	0.952
f_P	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	664	664	652	837	1,216	1,216
GP Flow (pcphpl)	332	332	326	419	608	608
Calculate Speed in General Purpose Lanes						
Lane Width (ft)	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6
TRD	0.8	0.8	0.8	0.8	0.8	0.8
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	72.7	72.7	72.7	72.7	72.7	72.7
Measured FFS	70.0	70.0	70.0	70.0	70.0	70.0
FFS Curve	70	70	70	70	70	70
Calculate Operations in General Purpose Lanes						
v/c ratio	0.14	0.14	0.14	0.17	0.25	0.25
Speed (mph)	70.0	70.0	70.0	70.0	70.0	70.0
Density (pcphpl)	4.7	4.7	4.7	6.0	8.7	8.7
LOS	A	A	A	A	A	A
Calculate Operations for Entering GP Lanes						
GP_{IN} Vol (pcph)		664		658	849	
GP_{IN} Cap (pcph)		4,800		4,800	4,800	
GP_{IN} v/c ratio		0.14		0.14	0.18	
Calculate Operations for Exiting GP Lanes						
GP_{OUT} Vol (pcph)		651		837	1,216	
GP_{OUT} Cap (pcph)		4,800		4,800	4,800	
GP_{OUT} v/c ratio		0.14		0.17	0.25	

Location	1	2	3	4	5	6



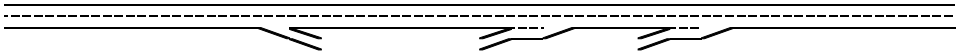
Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate On Ramp Flow Rate						
On Volume (vph)				156	320	
PHF				0.88	0.88	
Total Lanes				1	1	
Terrain				Level	Level	
Grade %				0.0%	0.0%	
Grade Length (mi)				0.00	0.00	
Truck & Bus %				2.0%	2.0%	
RV %				0.0%	0.0%	
E_T				1.5	1.5	
E_R				1.2	1.2	
f_{HV}				0.990	0.990	
f_P				1.00	1.00	
On Flow (pcph)				179	367	
On Flow (pcphpl)				179	367	
Calculate On Ramp Roadway Operations						
On Ramp Type				Right	Right	
On Ramp Speed (mph)				25	45	
On Ramp Cap (pcph)				1,900	2,100	
On Ramp v/c ratio				0.09	0.17	
Calculate Off Ramp Flow Rate						
Off Volume (vph)		10				
PHF		0.88				
Total Lanes		1				
Terrain		Level				
Grade %		0.0%				
Grade Length (mi)		0.00				
Truck & Bus %		20.0%				
RV %		0.0%				
E_T		1.5				
E_R		1.2				
f_{HV}		0.909				
f_P		1.00				
Off Flow (pcph)		13				
Off Flow (pcphpl)		13				
Calculate Off Ramp Roadway Operations						
Off Ramp Type		Right				
Off Ramp Speed		45				
Off Ramp Cap (pcph)		2,100				
Off Ramp v/c ratio		0.01				
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps						
Calculate Merge Influence Area Operations						
Effective v_P (pcph)				658	849	
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FM} (Eqn 13-3)				0.586	0.586	
P_{FM} (Eqn 13-4)						
P_{FM} (Eqn 13-5)						
P_{FM}				1.000	1.000	
v_{12} (pcph)				658	849	
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)				658	849	
v_{R12a} (pcph)				837	1,216	
Merge Speed Index				0.32	0.31	
Merge Area Speed				61.2	61.4	
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed				61.2	61.4	
Merge v/c ratio				0.18	0.26	
Merge Density				10.1	13.0	
Merge LOS				B	B	

Location	1	2	3	4	5	6



Key

<> Express Lane (HOV)

No Trucks

Name	I505 North of SR 16	SR 16 Off Ramp	I505 between SR 16 Ramp	SR 16 Loop On Ramp	SR 16 On Ramp	I505 South of SR 16
Calculate Diverge Influence Area Operations						
Effective v_p (pcph)		664				
Up Ramp L_{EQ}						
Down Ramp L_{EQ}						
P_{FD} (Eqn 13-9)		0.743				
P_{FD} (Eqn 13-10)						
P_{FD} (Eqn 13-11)						
P_{FD}		1.000				
v_{12} (pcph)		664				
v_3 (pcph)						
v_{34} (pcph)						
v_{12a} (pcph)		664				
Diverge Speed Index		0.30				
Diverge Area Speed		61.6				
Outer Lanes Volume						
Outer Lanes Speed						
Segment Speed		61.6				
Diverge v/c ratio		0.15				
Diverge Density		8.7				
Diverge LOS		A				
Summarize Segment Operations						
Segment v/c ratio	0.14	0.15	0.14	0.18	0.26	0.25
Segment Density	4.7	8.7	4.7	10.1	13.0	8.7
Segment LOS	A	A	A	B	B	A
Over Capacity						