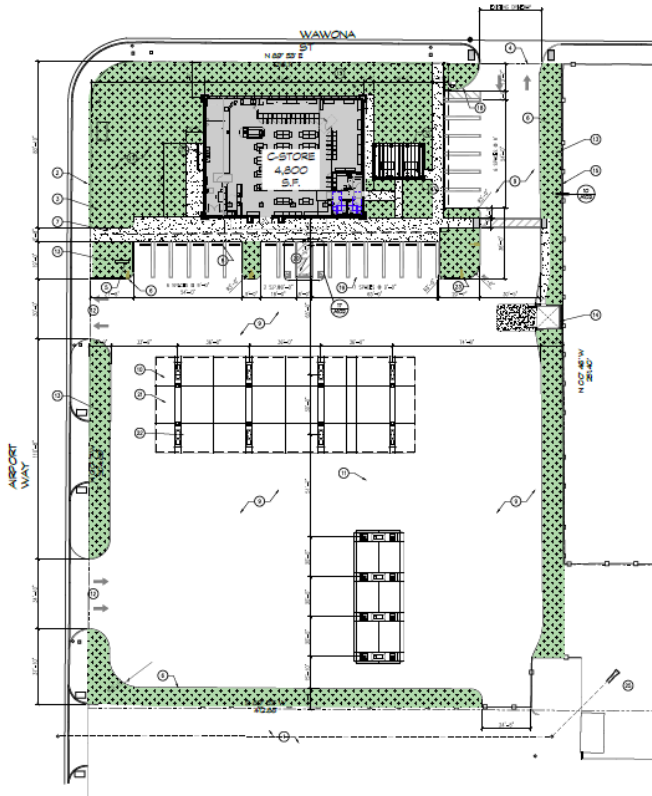


Rotten Robbie Fuel Station Project Transportation Impact Analysis Report



Prepared for:
City of Manteca

March 2020

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1. INTRODUCTION

This report documents the results of the Transportation Impact Analysis conducted for the proposed Rotten Robbie Service Station Project in Manteca, California. This *Transportation Impact Analysis* (TIA - March 2020) was prepared by Fehr & Peers for the proposed project under contract to the City of Manteca Community Development Department and J.B. Anderson Land Use Planning.

PROJECT DESCRIPTION

The Rotten Robbie Service Station project would construct 16-gasoline pumps, 4-diesel pumps, and a 4,800 square foot convenient store on an approximately two-acre site. The project would be located on the southeast corner of the intersection of Airport Way / Wawona Street. **Figure 1** displays the project area.

The site plan proposes the southern Airport Way driveway to be in only and the northern Airport Way driveway to be exit only. The Wawona Street driveway is planned to be full access. Because the northern Airport Way driveway is located within 150 feet of the Airport Way / Wawona Street intersection, permitting left outs could create additional conflict at the driveway with southbound Airport Way traffic entering the southern driveway. Therefore, it is recommended that the northern driveway be constructed as northbound right-turn in / right-turn out only and the southern Airport Way driveway be full access for inbound and outbound vehicles. This analysis included in this TIA is based on these recommended driveway access modifications. Site access is discussed in more detail in Section 5 of this report.

STUDY INTERSECTIONS

The following five study intersections were included in the analysis:

1. Airport Way / SR 120 EB Ramps;
2. Airport Way / SR 120 WB Ramps;
3. Airport Way / Daniels Street;
4. Airport Way / Wawona Street; and
5. Airport Way / Yosemite Avenue.

TRAFFIC ANALYSIS SCENARIOS

The study intersections were evaluated for the following four scenarios:

- **Scenario 1: Existing Conditions** – Analyzes operations as they exist today.
- **Scenario 2: Existing Plus Project Conditions** – Analyzes existing operations with the addition of trips generated from the proposed project.
- **Scenario 3: Cumulative No Project Conditions** – Analyzes cumulative year (2042) volumes based on the City of Manteca / San Joaquin Council of Governments Travel Demand Forecasting (TDF) Model, assuming the project site remains in its current state
- **Scenario 4: Cumulative Plus Project Conditions** – Analyzes cumulative year volumes with the addition of trips generated from the proposed project.

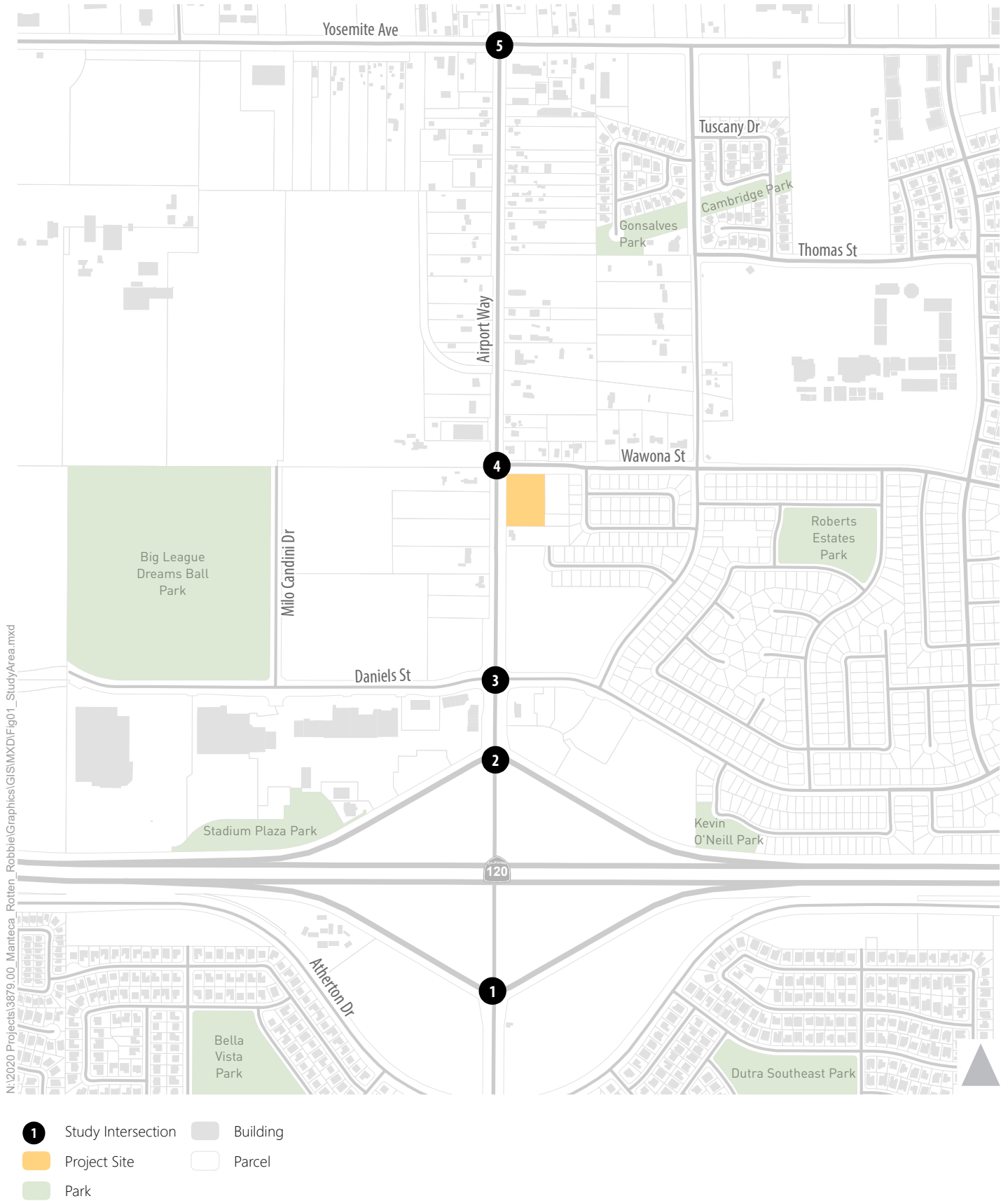


Figure 1
Study Area

2. ANALYSIS METHODOLOGY

This chapter describes the methods used to analyze the five study intersections described above, and to develop future year traffic forecasts for the study intersections.

DATA COLLECTION

Intersection turning movements and roadway segment traffic counts were collected on Thursday, November 21, 2019. Local schools were in session, and weather conditions were dry.

Weekday AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak period intersection turning movements were collected at the five (5) study intersections. **Figure 2** shows the intersection turning movements and lane configurations for the study intersections under Existing Conditions.

TRAVEL DEMAND FORECASTS

Using the City of Manteca / SJCOG sub-area Travel Demand Forecasting (TDF) Model, Cumulative Year 2042 traffic volume forecasts were developed for the study intersections.

The travel demand model incorporates the current RTP / Air Quality Model, Build-out of the current City of Manteca General Plan, and General Plans for the surrounding communities of Lathrop, Ripon, San Joaquin County, and Stockton. The Manteca General Plan Model also includes projects identified in the City's Public Facilities Improvement Plan (PFIP) and the Regional Transportation Plan / Sustainable Communities Strategy (RTP/SCS) Project List for:

- Mainline Highway Improvements (Table 6-1 from SJCOG RTP);
- Interchange Improvements (Table 6-1 from SJCOG RTP); and
- Regional Roadway Improvements (Table 6-3 from SJCOG RTP).

The traffic forecasting adjustment procedure known as the "difference method" was used to develop Cumulative Year (2042) AM and PM Peak Hour traffic forecasts. For a given intersection, this forecasting procedure is calculated as follows for every movement at the study intersections:

$$\text{Year 2042 Forecast} = \text{Existing Volume} + (\text{Year 2042 TDF Model} - \text{Base Year (2018) TDF Model})$$

INTERSECTION ANALYSIS

The study intersections were analyzed using procedures and methodologies contained in the *Highway Capacity Manual – 6th Edition* (Transportation Research Board, 2016). These methodologies were applied using Synchro 10 software which considers traffic volumes, lane configurations, signal timings, signal coordination, and other pertinent parameters of intersection operations.

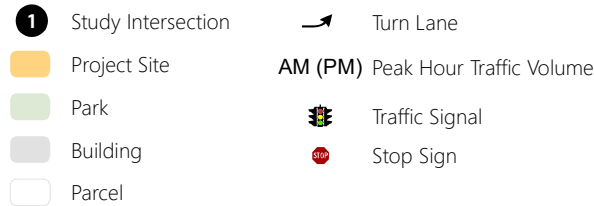
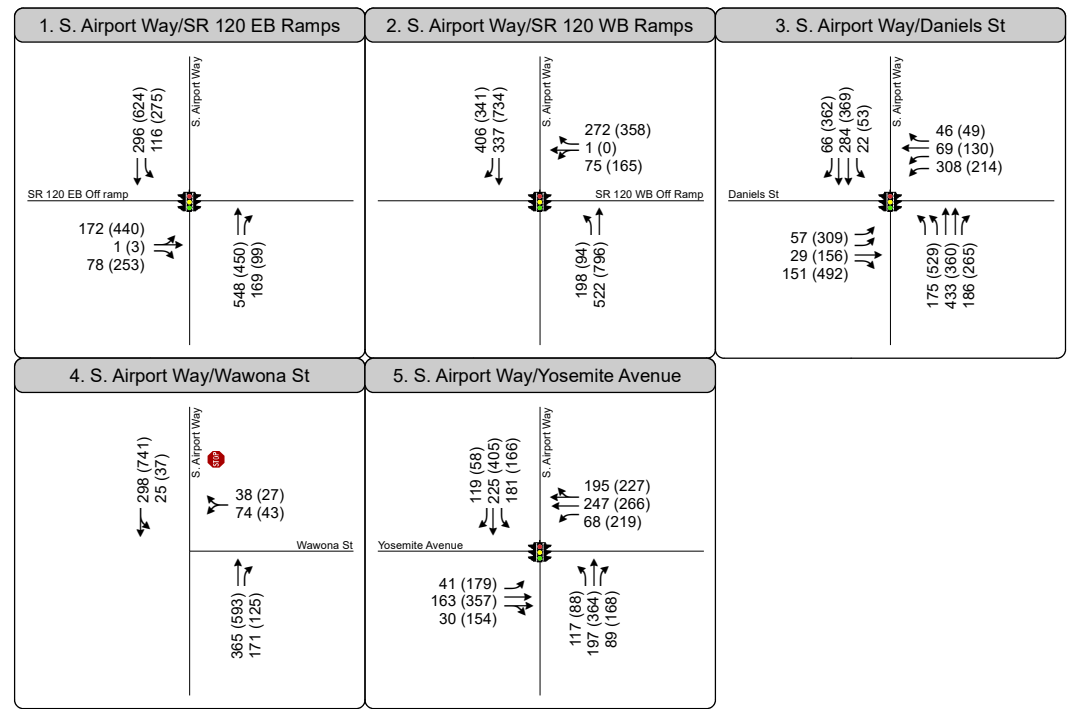


Figure 2

Peak Hour Traffic Volumes
and Lane Configurations -
Existing Conditions



The following describes the specific inputs, model parameters, and other aspects of the Synchro modeling, based on data collected in November 2019:

- Existing roadway geometrics and intersection lane configurations.
- The peak hour factor (PHF) observed each peak hour was used. The PHF measures peaking (lower values represent more peaking) during the busiest 15-minutes of the hour. A PHF of 0.84 and 0.95 were used for the AM and PM peak hour respectively.
- The heavy vehicle percentage observed during each peak hour was used. A heavy vehicle percentage of 4% and 1% were used for the AM and PM peak hour respectively.

LEVEL OF SERVICE DEFINITION

Each study intersection was analyzed using the concept of Level of Service (LOS). LOS is a qualitative measure of traffic operating conditions whereby a letter grade, from A (the best) to F (the worst), is assigned. These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. In general, LOS A represents free-flow conditions with no congestion, and LOS F represents severe congestion and delay under stop-and-go conditions. For signalized intersections and all-way stop controlled intersections, LOS is based on the average delay experienced by all vehicles passing through the intersection. For side-street stop-controlled intersections, the delay and LOS for the overall intersection is reported along with the delay for the worst-case movement. **Table 1** displays the delay range associated with each LOS category for signalized and unsignalized intersections.

Table 1: Intersections Level of Service (LOS) Criteria			
LOS	Description (for Signalized Intersections)	Average Delay (Seconds/Vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Operations with very low delay occurring with favorable traffic signal progression and/or short cycle lengths.	< 10.0	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0	> 10.0 to 15.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0	> 15.0 to 25.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0	> 25.0 to 35.0
E	Operations with high delay values indicating poor progression, and long cycle lengths. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55.0 to 80.0	> 35.0 to 50.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0	> 50.0
Note: LOS = level of service; V/C ratio = volume-to-capacity ratio LOS at signalized intersections and unsignalized all-way stop controlled intersections is based on average delay for all vehicles. LOS at unsignalized side-street stop-controlled intersections is reported for the entire intersection and for the minor street movement with the greatest delay. Source: Transportation Research Board, 2016			

STANDARDS OF SIGNIFICANCE

The City of Manteca 2023 General Plan Policy C-P-2 establishes the following level of service standard:

To the extent feasible, the City shall strive for a vehicular LOS of D or better at all streets and intersections, except in the Downtown area where right-of-way is limited, pedestrian, bicycle, and transit mobility are most important and vehicular LOS is not a consideration.

3. PROJECT IMPACTS UNDER EXISTING CONDITIONS

This chapter presents the transportation impact analysis results for Existing and Existing Plus Project Conditions. The following is a detailed description of the roadways that could be affected by the project:

- **Airport Way** is a north-south arterial in the City of Manteca extending from State Route 120 (SR 120) and W. Ripon Road to the south and French Camp Road and the City of Stockton to the north. Near the project site, Airport Way currently provides one travel lane in each direction. As part of the Public Facilities Improvement Plan (PFIP), Airport Way would be widened to two travel lanes in each direction with a center two-way left-turn lane.
- **Yosemite Avenue** is an east-west arterial in the City of Manteca extending from Guthmiller Road to the west until it turns into SR 120 east of SR 99. In the study area, Yosemite Avenue is a five-lane roadway with two lanes in each direction and a center two-way left-turn lane.
- **Daniels Street** is an east-west collector street in the study area. It extends from the Big League Dreams baseball field to the west to Union Road. West of Airport Way there are two lanes in each direction. East of Airport Way in the study area, it is three-lane roadway with one lane in each direction and a center two-way left-turn lane.
- **Wawona Street** is an east-west collector street stretching from Airport Way to Main Street. With the exception of the small section from Depot Drive to Fishback Road, it is a two-lane roadway with one lane in each direction. Under existing conditions, the Airport Way / Wawona Street is side-street stop controlled. As part of the PFIP, the Airport Way / Wawona Street would be signalized.

EXISTING LEVEL OF SERVICE

Table 2 presents the LOS results for the study intersections under existing conditions. Technical calculations are provided in Appendix A.

The primary conclusions of the AM Peak Hour Analysis are:

- One signalized intersection operates at LOS A (Airport Way / SR 120 WB Ramps);
- Two signalized intersections operate at LOS B (Airport Way / SR 120 EB Ramps and Airport Way / Yosemite Avenue)
- One signalized intersection operates at LOS D (Airport Way / Daniels Street)
- The side street stop controlled intersection of Airport Way / Wawona Street operates at LOS C for the westbound left-turn movement.

The primary conclusions of the PM Peak Hour Analysis are:

- Two signalized intersection operate at LOS B (Airport Way / SR 120 WB Ramps and Airport Way / SR 120 EB Ramps);
- One signalized intersection operates at LOS C (Airport Way / Yosemite Avenue)

- One signalized intersection operates at LOS D (Airport Way / Daniels Street)
- The side street stop controlled intersection of Airport Way / Wawona Street operates at LOS E for the westbound left-turn movement.

Table 2: Level of Service Analysis – Existing Conditions					
Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay ¹	LOS	Delay ¹	LOS
1) Airport Way / SR 120 EB Ramps	Signal	12.8	B	19.9	B
2) Airport Way / SR 120 EB Ramps	Signal	8.1	A	15.8	B
3) Airport Way / Daniels Street	Signal	47.5	D	41.9	D
4) Airport Way / Wawona Street	SSSC	3(19.5) (WBL)	A(C) (WBL)	2.1(38.1) (WBL)	A(E) (WBL)
5) Airport Way / Yosemite Avenue	Signal	19.2	B	29.9	C
Notes: LOS = Level of Service; SSSC = Side-Street Stop-Control ¹ For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For side-street stop-controlled intersections, average intersection and (worst-case movement) delay in seconds per vehicle is reported. Source: Fehr & Peers, 2020					

TRANSIT SERVICE

Transit service in the City of Manteca is provided by Manteca Transit. Transit Route 1 (eastbound / westbound / northbound), Transit Route 2 (eastbound / westbound), and Transit Route 4 (northbound / southbound) provide fixed route service near the study area. All three routes have a stop within half a mile of the project site.

BICYCLE AND PEDESTRIAN FACILITIES

Bicycle infrastructure near the project site consists of a Class II bike lane on Daniels Street east of Airport Way. A Class II bike lane is defined in the Manteca Bicycle Master Plan (City of Manteca, 2003) as a bike lane that provides a restricted right-of-way and is designated for the use of bicycles with a striped lane on a street or highway. There is a Class III bike route on Wawona Street. The Manteca Bicycle Master Plan defines a Class III bike route as a facility that provides for a right-of-way designated by signs or pavement markings for shared use with pedestrians or motor vehicles.

The City of Manteca is currently updating their bicycle master plan. As part of the update, Class II bicycle facilities are being planned along Airport Way.

The pedestrian network in the study area includes sidewalks on the following sections of roadway:

- South side of Wawona Street east of the project site
- Daniels Street,
- East side of Airport Way from the SR 120 EB Ramps to Wawona Street.

Sidewalks in the area are being constructed as development occurs; therefore, significant gaps in the pedestrian network currently exist. However, these gaps will be reduced, if not eliminated, as the area continues to build out.

PROJECT TRIP GENERATION

Table 3 presents the estimated trips generated by the proposed project for weekday daily, AM and PM peak hour conditions. The trips generated are based on trip rates from the *Trip Generation Manual 10th Edition* (Institute of Transportation Engineers, 2017). Pass-by trips and diverted trips (described below) were also considered.

Pass-by Trips

Pass-by trips represent drivers already travelling on the street adjacent to the project that decide to patronize the project site. Therefore, pass-by trips are not generated by the project but are existing vehicles attracted to the project site. The rates were calculated from the *Trip Generation Handbook, 3rd Edition*. Because daily pass-by rates are not available in the *Trip Generation Handbook*, the PM peak hour pass-by rates were applied as daily estimates.

Diverted Trips

Diverted trips are similar to pass-by trips, except they divert from their original route on a nearby transportation facility that does not provide direct access to the site. In this case, the diverted trips that patronize the service station are expected to come from SR 120; so, a vehicle that is already on the freeway would exit Airport Way, drive northbound to access the service station, and then drive southbound to get back onto SR 120. The diverted trip rate was developed by using data provided in ITE's *Trip Generation Handbook, 3rd Edition* (2017).

As shown below, the project would generate approximately 525 net daily vehicle trips, 43 net AM peak hour trips, and 36 net PM peak hour trips.

Table 3: Project Trip Generation										
Land Use	ITE Code	Quantity	Units	Daily	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Gasoline/Service Station	945	20	vehicle fueling positions	4,107	249	127	122	280	143	137
Total Driveway Trips				4,107	249	127	122	280	143	137
<u>Pass-by Percentages</u>			56%	-2300	62%	-78	-76	56%	-80	-77
<u>Diverted Trip Percentages</u>			31%	-1282	21%	-26	-26	31%	-45	-42
Net New Trips				525	43	23	20	36	18	18
Source: Fehr & Peers, 2020										

TRIP DISTRIBUTION/ASSIGNMENT

Pass-by trips, diverted trips, and net new trips has separate distributions. Project trips were assigned based on the distributions described below as well as permitted turning movements.

Pass-by Trips

Pass-by trips are defined to be already traveling along Airport Way and decide to go to Rotten Robbie on their way to their destination. The distribution of these trips, whether northbound or southbound, was based on existing volumes. The trips were distributed as follows:

AM: 60%/40% northbound/southbound

PM: 50%/50% northbound/southbound

Diverted Trips

As discussed above, diverted trips would come from SR 120, go to Rotten Robbie and then return to SR 120 to their destination. The eastbound/westbound distribution of these trips was based on existing volumes. The trips were distributed as follows:

AM: 40%/60% eastbound/westbound

PM: 50%/50% eastbound/westbound

Net New Trips

The proposed project was added to the City of Manteca / SJCOG sub-area Travel Demand Forecasting (TDF) Model to determine the trip distribution for net new trips. Because diverted trips would only come from SR 120, no additional trips were assigned to or from the freeway. The remaining trip distribution percentages were weighted to reflect this change.

Figure 3 displays the distribution for the net new trips. Net new trips only make up about 13% of the total driveway trips .

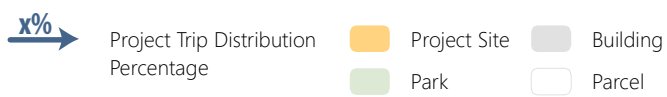
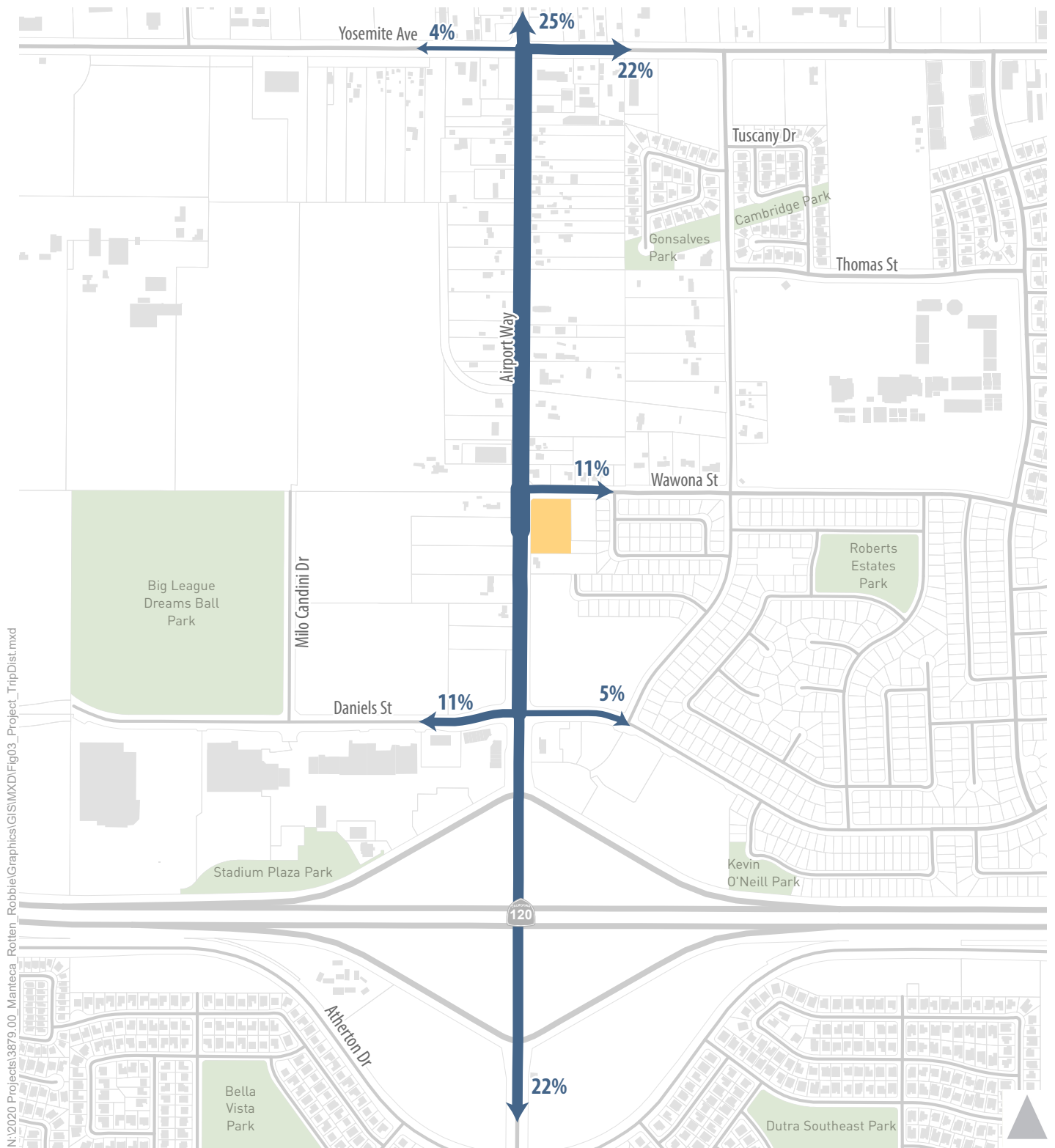


Figure 3
Net New Project Trip Distribution

EXISTING PLUS PROJECT INTERSECTION LEVELS OF SERVICE

Table 4 displays intersection LOS and delay under existing plus project conditions. Technical calculations are provided in Appendix B. **Figure 4** displays the peak hour turning movements and lane configurations for Existing Plus Project Conditions.

The primary conclusions of the AM Peak Hour Analysis are:

- One signalized intersection will continue to operate at LOS A (Airport Way / SR 120 WB Ramps);
- Two signalized intersections will continue to operate at LOS B (Airport Way / SR 120 EB Ramps and Airport Way / Yosemite Avenue)
- One signalized intersection will continue to operate at LOS D (Airport Way / Daniels Street)
- The side street stop controlled intersection of Airport Way / Wawona Street will continue to operate at LOS C for the westbound left-turn movement.

The primary conclusions of the PM Peak Hour Analysis are:

- One signalized intersection will continue to operate at LOS B (Airport Way / SR 120 WB Ramps);
- Two signalized intersections are projected to operate at LOS C (and Airport Way / SR 120 EB Ramps and Airport Way / Yosemite Avenue)
- One signalized intersection will continue to operate at LOS D (Airport Way / Daniels Street)
- The side street stop controlled intersection of Airport Way / Wawona Street will continue to operate at LOS E for the westbound left-turn movement.

Based on the results of the Existing Plus Project Intersection Level of Service Analysis, the Rotten Robbie project should pay their PFIP fair share cost to signalize the intersection of Airport Way / Wawona Street when signal warrants are met for both AM and PM Peak Hour Conditions.

Table 4: Level of Service Analysis – Existing Plus Project Conditions									
Intersection	Control	Existing Conditions				Existing Plus Project Conditions			
		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) Airport Way / SR 120 EB Ramps	Signal	12.8	B	19.9	B	13.9	B	22.6	C
2) Airport Way / SR 120 WB Ramps	Signal	8.1	A	15.8	B	8.3	A	18.4	B
3) Airport Way / Daniels Street	Signal	47.5	D	41.9	D	46.2	D	42.3	D
4) Airport Way / Wawona Street	SSSC	3(19.5) (WBL)	A(C) (WBL)	2.1(38.1) (WBL)	A(E) (WBL)	3.3(20) (WBL)	A(C) (WBL)	2(38.2) (WBL)	A(E) (WBL)
5) Airport Way / Yosemite Avenue	Signal	19.2	B	29.9	C	19.4	B	30.4	C
Notes: LOS = Level of Service; SSSC = Side-Street Stop-Control ¹ For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For side-street stop-controlled intersections, average intersection and (worst-case movement) delay in seconds per vehicle is reported. ² The majority of project trips at Airport Way/Daniels was added to the northbound/southbound movements which experience less delay than the eastbound/westbound movements. Therefore, these movements are weighted more heavily, decreasing the overall delay of the intersection. Source: Fehr & Peers, 2020									

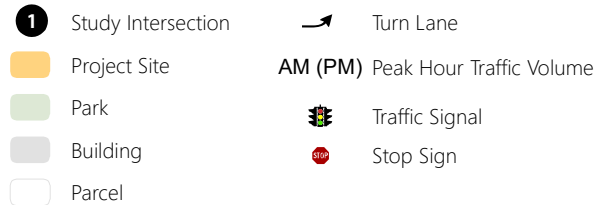
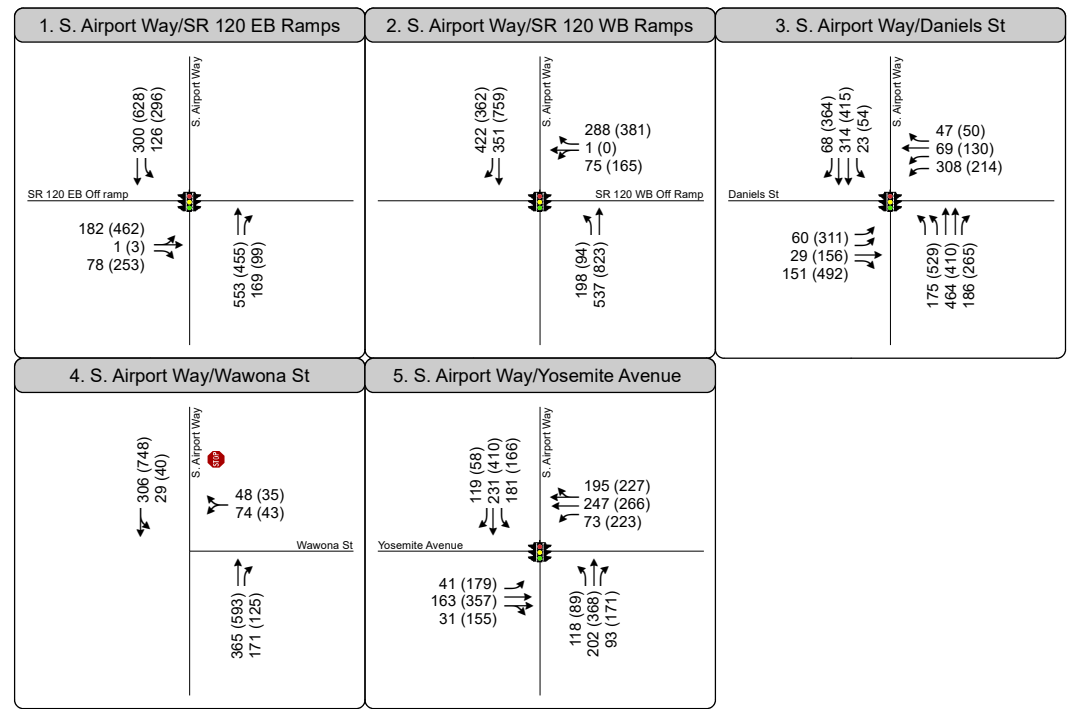


Figure 4

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



4. CUMULATIVE CONDITIONS ANALYSIS

This chapter presents the results for Cumulative No Project and Cumulative Plus Project Conditions.

There are planned lane configuration changes at all of the study intersections as part of the Manteca Public Facilities Implementation Plan (PFIP). The intersection of Airport Way / Wawona Street is also planned to be signalized. In addition to the modifications specifically outlined in the PFIP, the following design refinements were incorporated based on available PFIP right-of-way at the following two (2) study intersections:

Airport Way / Yosemite Ave

The PFIP currently proposes one eastbound left turn lane. However, the plan provides a median that can be converted to a second eastbound left turn lane if needed. This analysis includes the second eastbound left turn pocket (260 feet) to serve the projected Cumulative No Project PM peak hour traffic volumes.

Airport Way / Daniels Street

Eastbound Daniels Street currently has one eastbound right turn lane. This analysis includes the intersection shifted to the north in order to add a second eastbound right turn pocket to serve the projected Cumulative No Project PM peak hour traffic volumes. The westbound lanes would also need to be shifted north so that the eastbound through lane continues to align with the receiving lane.

Figure 5 displays the peak hour turning movements and lane configurations for Cumulative No Project Conditions.

CUMULATIVE NO PROJECT INTERSECTION LEVELS OF SERVICE

Table 5 displays the results of the Cumulative No Project operations analysis.. Technical calculations are provided in Appendix C.

The primary conclusions of the AM Peak Hour Analysis are:

- Two signalized intersections operate at LOS A (Airport Way / SR 120 EB Ramps and Airport Way / Wawona Street);
- One signalized intersection operates at LOS B (Airport Way / SR 120 WB Ramps)
- One signalized intersection operates at LOS C (Airport Way / Daniels Street)
- One signalized intersection operates at LOS D (Airport Way / Yosemite Ave)

The primary conclusions of the PM Peak Hour Analysis are:

- One signalized intersection operates at LOS A (Airport Way / Wawona Street);
- Two signalized intersections operate at LOS B (Airport Way / SR 120 EB Ramps and Airport Way / SR 120 WB Ramps)
- Two signalized intersections operate at LOS D (Airport Way / Daniels Street and Airport Way / Yosemite Ave)

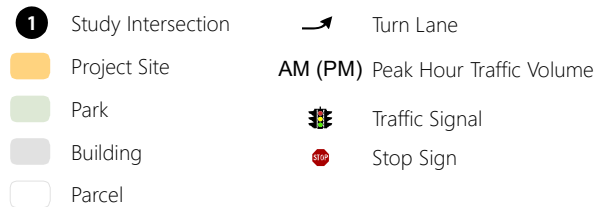
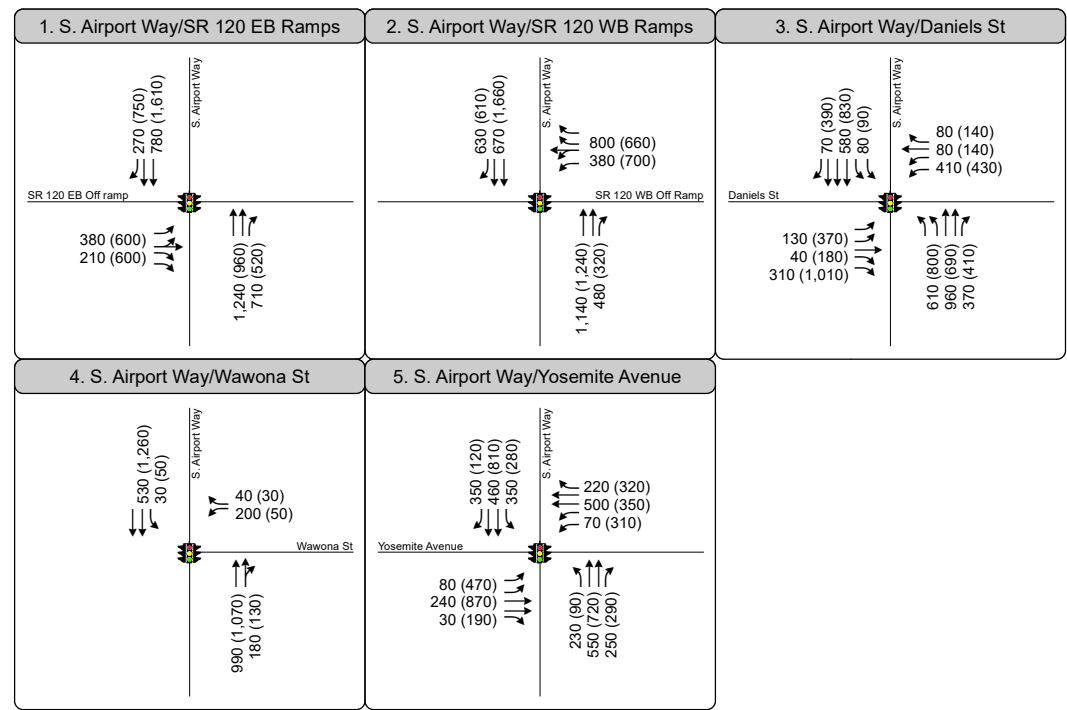


Figure 5
Peak Hour Traffic Volumes
and Lane Configurations -
Cumulative No Project Conditions



Table 5: Level of Service Analysis – Cumulative No Project Conditions									
Intersection	Control	Existing Conditions				Cumulative No Project Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay ²	LOS	Delay ²	LOS	Delay ²	LOS	Delay ²	LOS
1) Airport Way / SR 120 EB Ramps	Signal	12.8	B	19.9	B	8	A	13.8	B
2) Airport Way / SR 120 WB Ramps	Signal	8.1	A	15.8	B	13.3	B	15.7	B
3) Airport Way / Daniels Street	Signal	47.5	D	41.9	D	29	C	54.4	D
4) Airport Way / Wawona Street	SSSC/Signal ¹	3(19.5) (WBL)	A(C) (WBL)	2.1(38.1) (WBL)	A(E) (WBL)	8.6	A	5.1	A
5) Airport Way / Yosemite Avenue	Signal	19.2	B	29.9	C	44.3	D	48.7	D
Notes: LOS = Level of Service; SSSC = Side-Street Stop Control ¹ Under existing conditions, intersection control for Airport Way / Wawona Street is SSSC. Under cumulative conditions, intersection control for the intersection is a traffic signal. ² For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For side-street stop-controlled intersections, average intersection and (worst-case movement) delay in seconds per vehicle is reported. Source: Fehr & Peers, 2020									

CUMULATIVE PLUS PROJECT INTERSECTION LEVELS OF SERVICE

Project trips were added to Cumulative No Project volumes. The same trip generation estimates and trip distribution patterns for project-generated traffic used for Existing Plus Project conditions was also applied for Cumulative Plus Project Conditions. **Figure 6** displays the peak hour turning movements and lane configurations for Cumulative Plus Project Conditions.

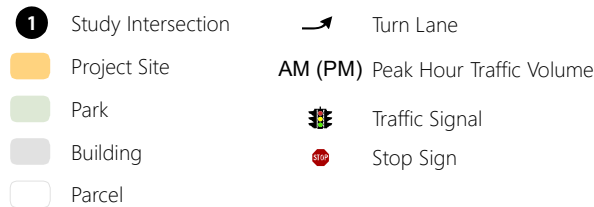
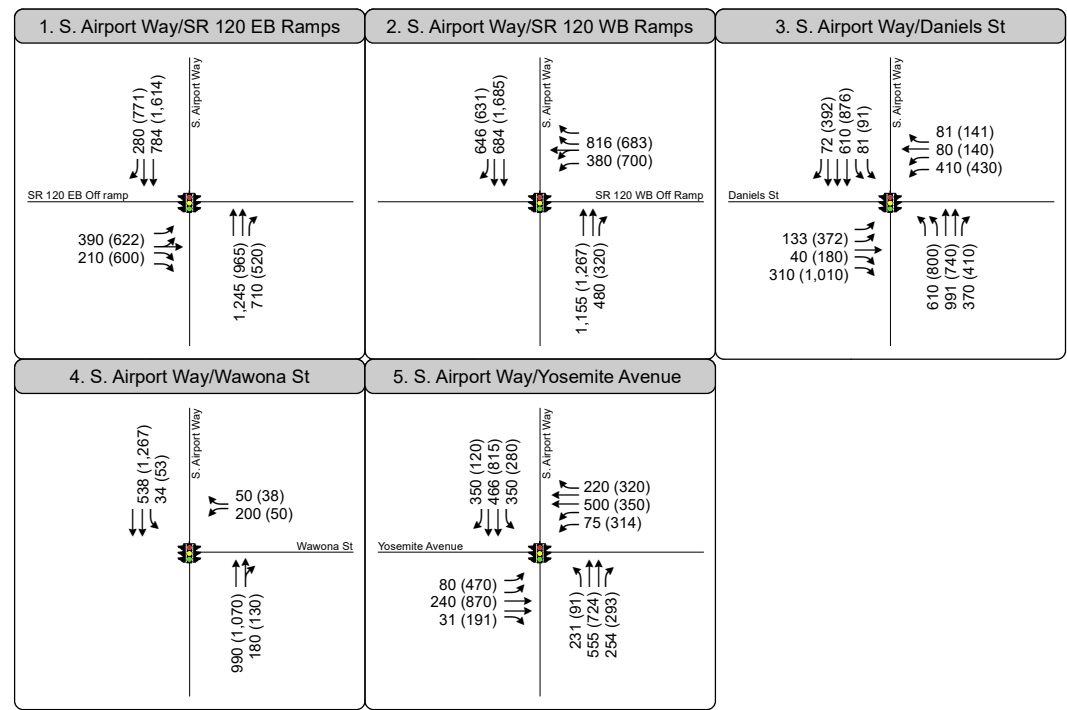


Figure 6
Peak Hour Traffic Volumes
and Lane Configurations -
Cumulative Plus Project Conditions

Table 6 displays the results of the Cumulative Plus Project Conditions operations analysis. Technical calculations are provided in Appendix D.

The primary conclusions of the AM Peak Hour Analysis are:

- Two signalized intersections will continue to operate at LOS A (Airport Way / SR 120 EB Ramps and Airport Way / Wawona Street);
- One signalized intersection will continue to operate at LOS B (Airport Way / SR 120 WB Ramps)
- One signalized intersection will continue to operate at LOS C (Airport Way / Daniels Street)
- One signalized intersection will continue to operate at LOS D (Airport Way / Yosemite Ave)

The primary conclusions of the PM Peak Hour Analysis are:

- One signalized intersection will continue to operate at LOS A (Airport Way / Wawona Street);
- Two signalized intersections will continue to operate at LOS B (Airport Way / SR 120 EB Ramps and Airport Way / SR 120 WB Ramps)
- Two signalized intersections will continue to operate at LOS D (Airport Way / Daniels Street and Airport Way / Yosemite Ave)

Table 6: Level of Service Analysis – Cumulative Plus Project Conditions									
Intersection	Control	Cumulative No Project Conditions				Cumulative Plus Project Conditions			
		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) Airport Way / SR 120 EB Ramps	Signal	8.0	A	13.8	B	8.1	A	14	B
2) Airport Way / SR 120 WB Ramps	Signal	13.3	B	15.7	B	13.7	B	16.1	B
3) Airport Way / Daniels Street	Signal	29	C	54.4	D	29	C	54.7	D
4) Airport Way / Wawona Street	Signal	8.6	A	5.1	A	8.7	A	5.5	A
5) Airport Way / Yosemite Avenue	Signal	44.3	D	48.7	D	44.5	D	49.2	D
Notes: LOS = Level of Service ¹ For signalized intersections average intersection delay is reported in seconds per vehicle for all approaches. Source: Fehr & Peers, 2020									

5. PROJECT ACCESS EVALUATION

This section evaluates several access and on-site circulation considerations for the proposed Rotten Robbie Project located on the southeast corner of the intersection of Airport Way / Wawona Street. **Figure 7** displays the site plan recommendations.

BICYCLE AND PEDESTRIAN CIRCULATION

Bicycle infrastructure near the project site consists of a Class II bike lane on Daniels Street east of Airport Way and a Class III bike route on Wawona Street. Class II bicycle facilities are being planned along Airport Way as part of the City's bicycle master plan update.

The City requires two bicycle parking spaces for nonresidential land uses with between 1 and 29 total vehicle parking spaces. Therefore, it is recommended that the site plan provide a minimum of two bicycle parking spaces to encourage biking to the convenient store.

The project is proposing sidewalks along the southern and eastern edge of the convenient store that connect to the existing sidewalks on Airport Way and Wawona Street. The parking spaces are directly in front of the store and next to the sidewalks, so pedestrians accessing the convenient store from these spaces will not conflict with vehicles. Additionally, fuel trucks are not expected to use the northern Airport Way driveway. Therefore, pedestrians crossing the drive aisle between the gasoline fuel pumps and the convenient store should not conflict with heavy vehicles.

ON-SITE PARKING

The Manteca Municipal Code requires service stations to provide one parking space per pump island plus one space per service bay. The proposed site plan calls for 16 regular pump islands and does not provide any additional automotive services (i.e. oil changes, etc.). Therefore, the project would be required to provide 16 parking spaces. The current site plan provides twenty-one parking spaces; therefore, it meets parking requirements.

For sites with 1-25 parking spaces, a total of one accessible parking space is required and there must be one van accessible space. The project provides two accessible spaces, one of which is a van accessible space. This meets the Americans with Disabilities Act (ADA) requirements.

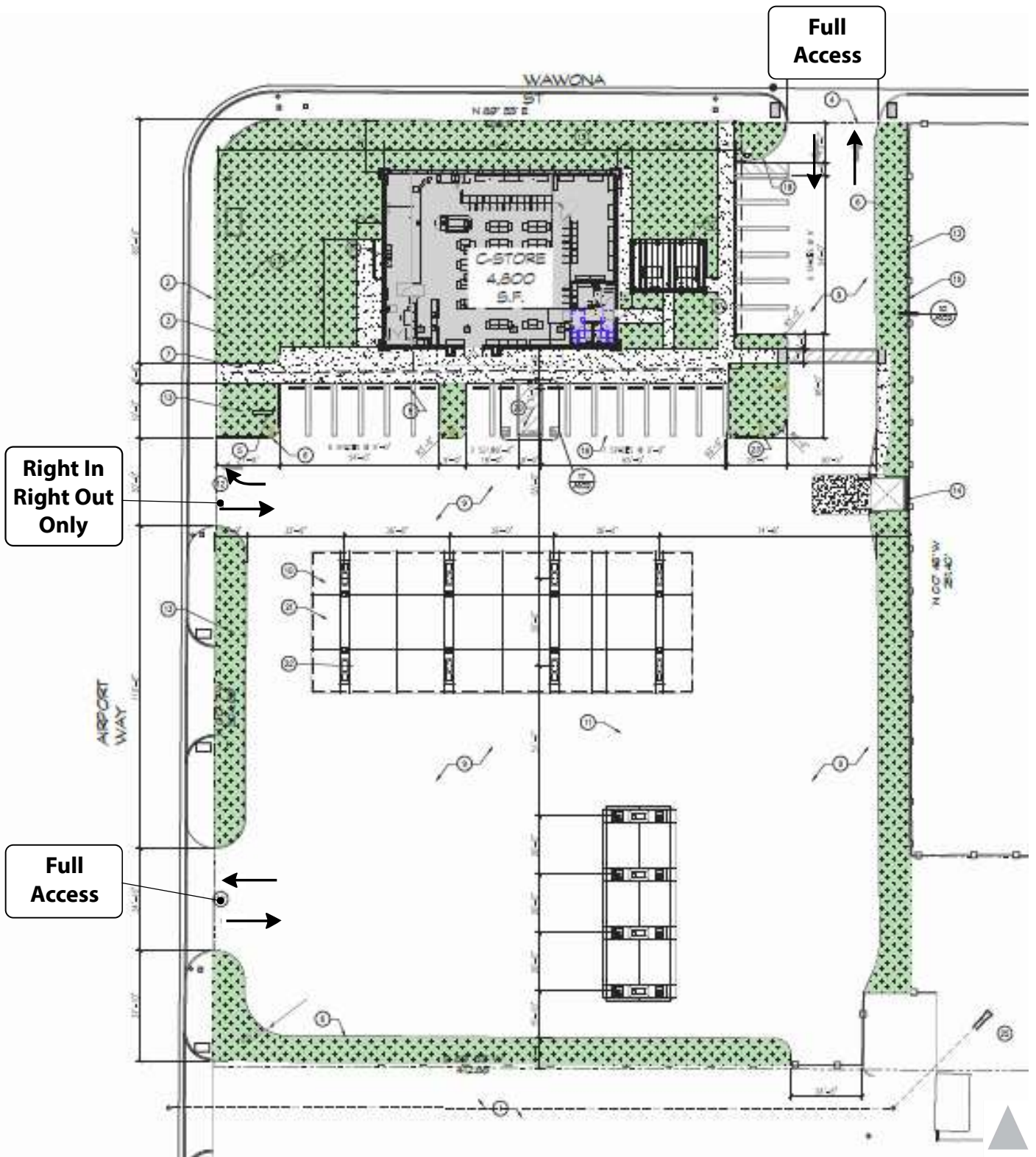


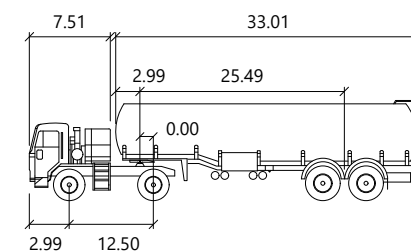
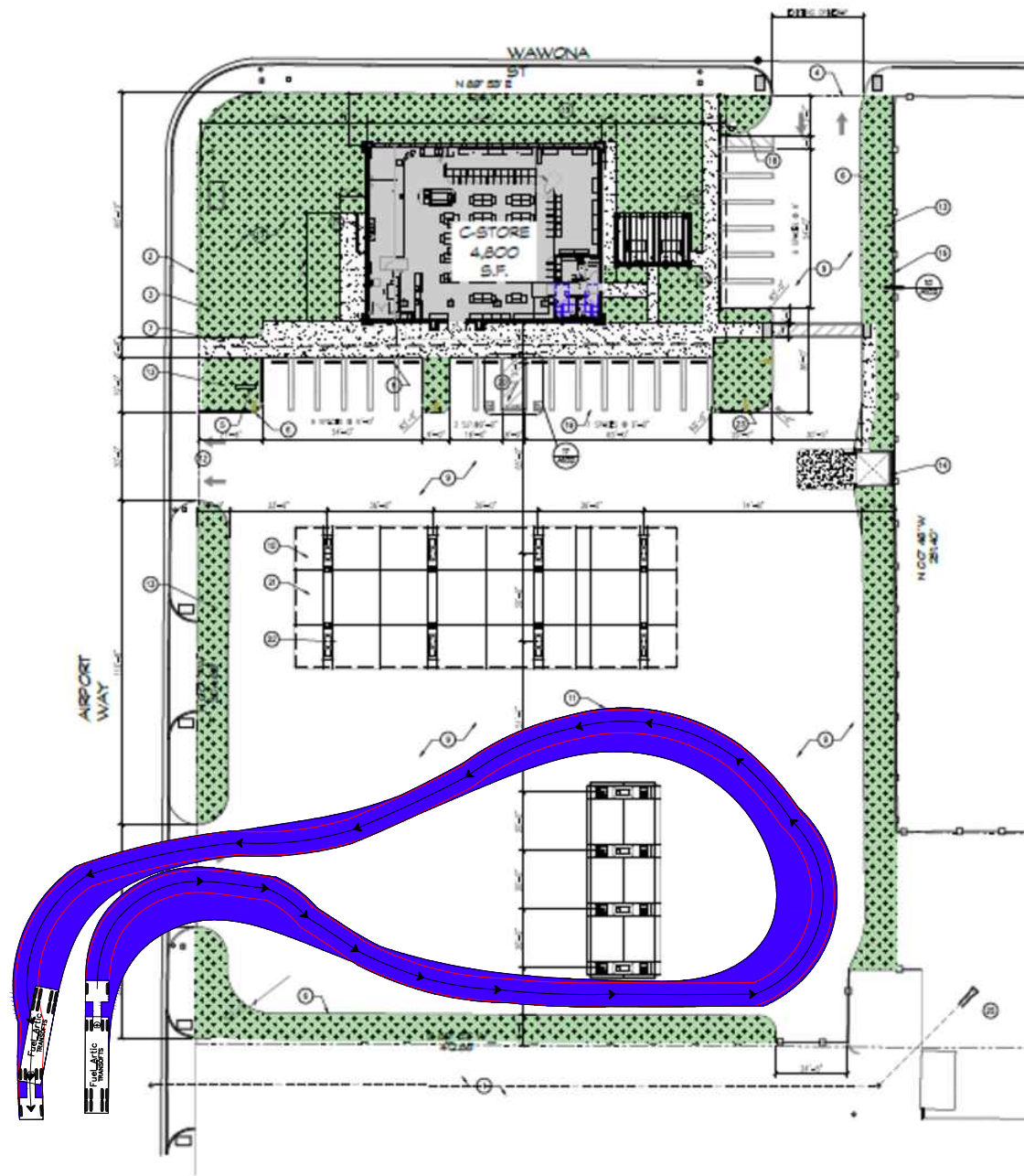
Figure 7
Project Site Plan Recommendations

SITE ACCESS AND CIRCULATION

As mention in the project description, the site plan proposes the southern Airport Way driveway to be in only and the northern Airport Way driveway to be exit only. The Wawona Street driveway is planned to be full access. Because the northern Airport Way driveway is located within 150 feet of the Airport Way / Wawona Street intersection, permitting left outs could create additional conflict at the driveway with southbound Airport Way traffic entering the southern driveway. Therefore, it is recommended that the northern driveway be constructed as northbound right-turn in / right-turn out only and the southern Airport Way driveway be full access for inbound and outbound vehicles.

The driveway on Wawona Street and the northern driveway on Airport Way are each 30 feet wide. The southern driveway on Airport Way is approximately 35 feet wide. This is a sufficient width for vehicles, including semi-trailer trucks and fuel trucks to enter and exit the site.

The dumpster is located in an area that is easily accessible to refuse trucks. There is sufficient space for both a fuel truck and a semi-truck to access the site from the southern Airport Way driveway, access the diesel fuel pumps, and loop around to exit from the same driveway. There is also adequate room for a pickup truck to access the pumps and parking spaces. Error! Reference source not found. **Figure 8 - Figure 10** displays the potential path for a fuel truck, semi-trailer truck, and passenger truck and shows the proposed on-sire circulation is adequate for all vehicle types

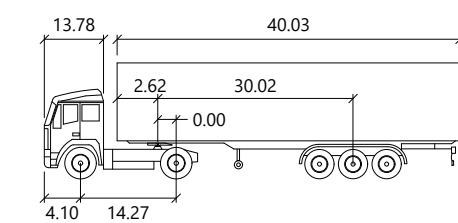
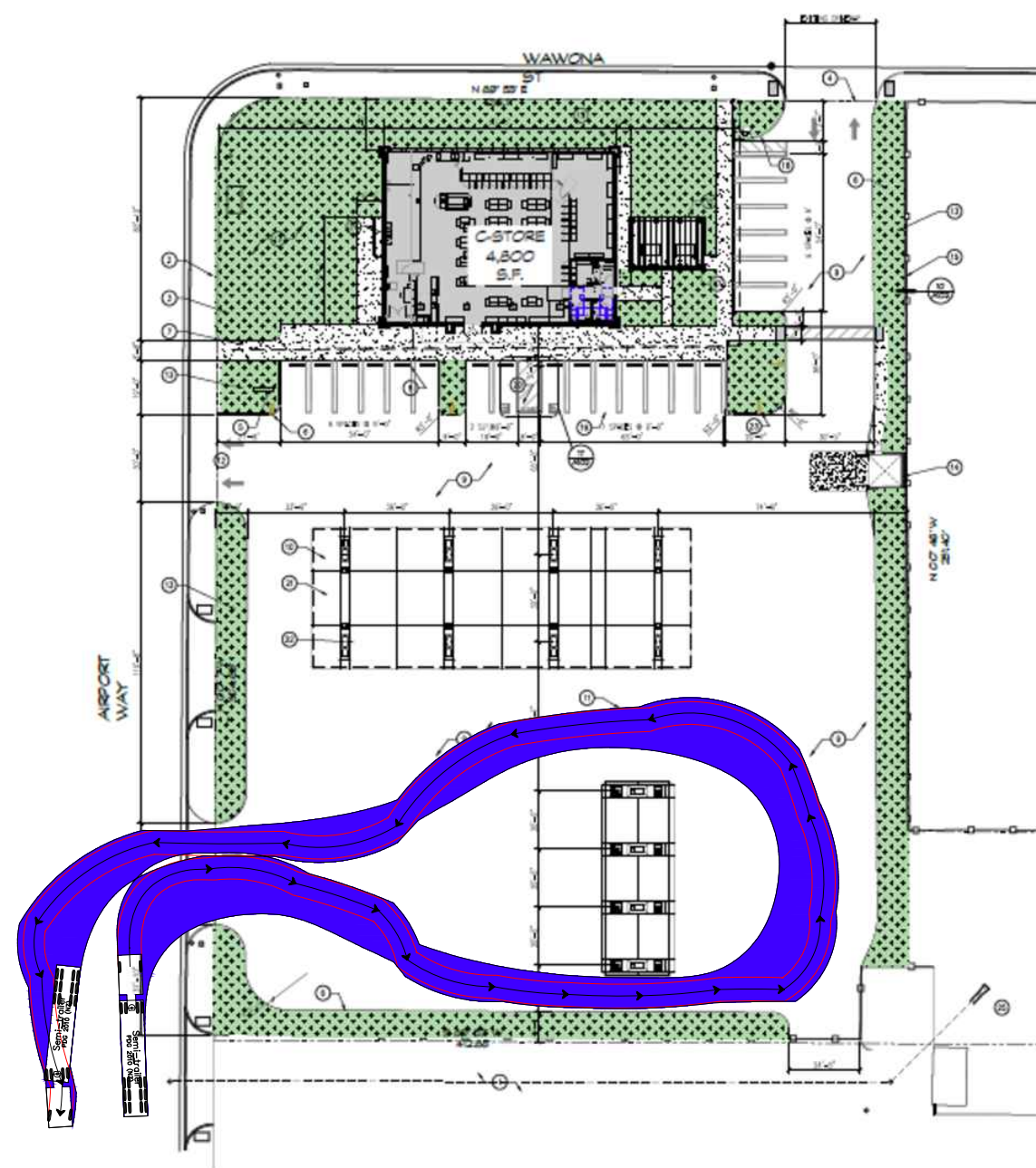


Fuel Artic

	feet		
Tractor Width	: 8.01	Lock to Lock Time	: 6.0
Trailer Width	: 8.01	Steering Angle	: 20.3
Tractor Track	: 8.01	Articulating Angle	: 70.0
Trailer Track	: 8.01		



Figure 8:
Turning Analysis
Fuel Truck



Semi-trailer			
	feet		
Tractor Width	: 8.20	Lock to Lock Time	: 6.0
Trailer Width	: 8.20	Steering Angle	: 31.7
Tractor Track	: 8.20	Articulating Angle	: 70.0
Trailer Track	: 8.20		



Figure 9:
Turning Analysis
Semi-Trailer Truck

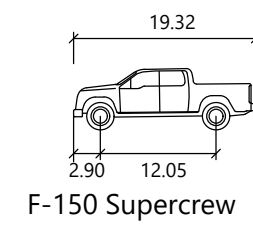
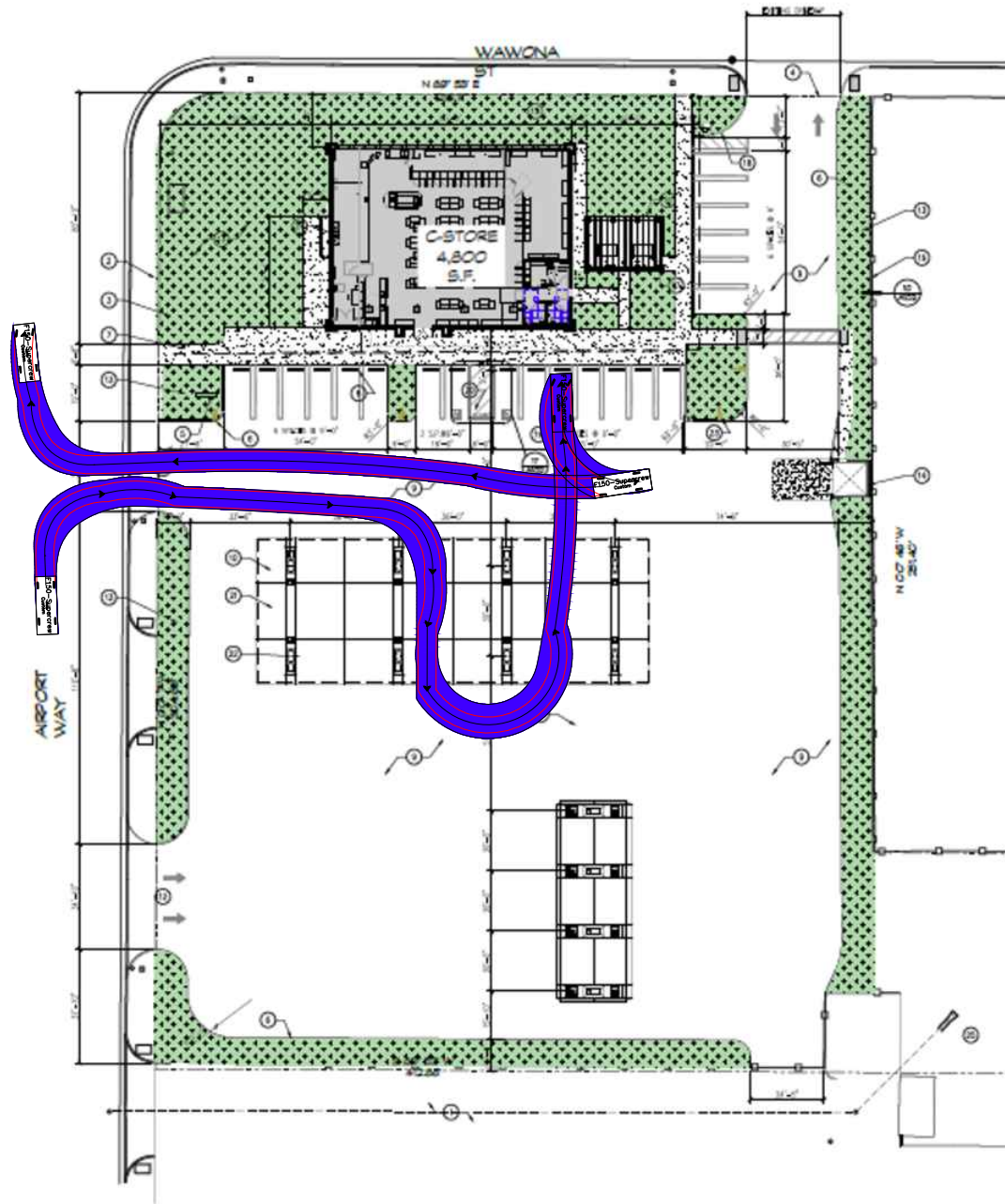


Figure 10:
Turning Analysis
Passenger Truck



6. TRANSPORTATION IMPACT ANALYSIS CONCLUSIONS

This chapter presents the conclusions of the transportation impact analysis for the proposed Rotten Robbie Service Station in Manteca, California. The project would construct 16-gasoline pumps, 4-diesel pumps, and a 4,800 square foot convenient store.

RESULTS OF THE INTERSECTION LEVEL OF SERVICE ANALYSIS

All intersections would operate acceptably at LOS D or better under Existing Plus Project and Cumulative Plus Project conditions. Therefore, impacts of the proposed project would be considered less than significant.

Under Existing Conditions all intersections operate at acceptable LOS D or better. The addition of project-related traffic would result in a slight increase in delays, but all five (5) study intersections will continue to operate at acceptable level of service conditions.

The primary conclusions of the AM Peak Hour Analysis are:

- One signalized intersection will continue to operate at LOS A (Airport Way / SR 120 WB Ramps);
- Two signalized intersections will continue to operate at LOS B (Airport Way / SR 120 EB Ramps and Airport Way / Yosemite Avenue)
- One signalized intersection will continue to operate at LOS D (Airport Way / Daniels Street)
- The side street stop controlled intersection of Airport Way / Wawona Street will continue to operate at LOS C for the westbound left-turn movement.

The primary conclusions of the PM Peak Hour Analysis are:

- One signalized intersection will continue to operate at LOS B (Airport Way / SR 120 WB Ramps);
- Two signalized intersections are projected to operate at LOS C (and Airport Way / SR 120 EB Ramps and Airport Way / Yosemite Avenue)
- One signalized intersection will continue to operate at LOS D (Airport Way / Daniels Street)
- The side street stop controlled intersection of Airport Way / Wawona Street will continue to operate at LOS E for the westbound left-turn movement.

Based on the results of the Existing Plus Project Intersection Level of Service Analysis, the Rotten Robbie project should pay their PFIP fair share cost to signalize the intersect

Cumulative No Project Conditions includes the adopted and fully funded PFIP improvements, including the modifications discussed in Section 4.

The primary conclusions of the AM Peak Hour Analysis are:

- Two signalized intersections will continue to operate at LOS A (Airport Way / SR 120 EB Ramps and Airport Way / Wawona Street);
- One signalized intersection will continue to operate at LOS B (Airport Way / SR 120 WB Ramps)
- One signalized intersection will continue to operate at LOS C (Airport Way / Daniels Street)
- One signalized intersection will continue to operate at LOS D (Airport Way / Yosemite Ave)

The primary conclusions of the PM Peak Hour Analysis are:

- One signalized intersection will continue to operate at LOS A (Airport Way / Wawona Street);
- Two signalized intersections will continue to operate at LOS B (Airport Way / SR 120 EB Ramps and Airport Way / SR 120 WB Ramps)
- Two signalized intersections will continue to operate at LOS D (Airport Way / Daniels Street and Airport Way / Yosemite Ave)

Based on the results of the Intersection Level of Service Analysis, the Rotten Robbie project should pay their PFIP fair share cost to signalize the intersection of Airport Way / Wawona Street when signal warrants are met for both AM and PM Peak Hour Conditions

PROJECT SITE ACCESS CONSIDERATIONS

The site plan proposes the southern Airport Way driveway to be in only and the northern Airport Way driveway to be exit only. The Wawona Street driveway is planned to be full access. Because the northern Airport Way driveway is located within 150 feet of the Airport Way / Wawona Street intersection, permitting left outs could create additional conflict at the driveway with southbound Airport Way traffic entering the southern driveway. Therefore, it is recommended that the northern driveway be constructed as northbound right-turn in / right-turn out only and the southern Airport Way driveway be full access for inbound and outbound vehicles.

The Manteca Municipal Code requires service stations to provide one parking space per pump island plus one space per service bay. The proposed site plan calls for 16 regular pump islands and does not provide any additional automotive services (i.e. oil changes, etc.). Therefore, the project would be required to provide 16 parking spaces. The current site plan provides twenty-one parking spaces; therefore, it meets parking requirements.

For sites with 1-25 parking spaces, a total of one accessible parking space is required and there must be one van accessible space. The project provides two accessible spaces, one of which is a van accessible space. This meets the Americans with Disabilities Act (ADA) requirements.

The City requires two bicycle parking spaces for nonresidential land uses with between 1 and 29 total vehicle parking spaces. Therefore, it is recommended that the site plan provide a minimum of two bicycle parking spaces to encourage biking to the convenient store.

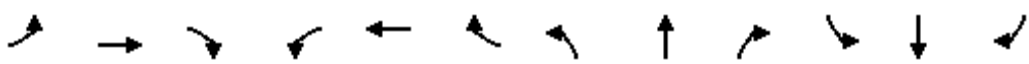
Appendix A



Manteca Rotten Robbie

1: S. Airport Way & SR 120 EB Off ramp/SR 120 EB On ramp

Existing Condition-AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗					↑	↗	↖	↑	
Traffic Volume (veh/h)	172	1	78	0	0	0	0	548	169	116	296	0
Future Volume (veh/h)	172	1	78	0	0	0	0	548	169	116	296	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841				0	1841	1841	1841	1841	0
Adj Flow Rate, veh/h	205	1	1				0	652	90	138	352	0
Peak Hour Factor	0.84	0.84	0.84				0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4				0	4	4	4	4	0
Cap, veh/h	285	1	255				0	792	656	182	1168	0
Arrive On Green	0.16	0.16	0.16				0.00	0.43	0.43	0.10	0.63	0.00
Sat Flow, veh/h	1745	9	1560				0	1841	1526	1753	1841	0
Grp Volume(v), veh/h	206	0	1				0	652	90	138	352	0
Grp Sat Flow(s),veh/h/ln	1753	0	1560				0	1841	1526	1753	1841	0
Q Serve(g_s), s	4.4	0.0	0.0				0.0	12.4	1.4	3.0	3.4	0.0
Cycle Q Clear(g_c), s	4.4	0.0	0.0				0.0	12.4	1.4	3.0	3.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	287	0	255				0	792	656	182	1168	0
V/C Ratio(X)	0.72	0.00	0.00				0.00	0.82	0.14	0.76	0.30	0.00
Avail Cap(c_a), veh/h	884	0	786				0	1021	846	707	1948	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.7	0.0	13.9				0.0	10.0	6.8	17.3	3.3	0.0
Incr Delay (d2), s/veh	3.4	0.0	0.0				0.0	4.4	0.1	6.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0				0.0	3.9	0.3	1.3	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	0.0	13.9				0.0	14.3	6.9	23.6	3.4	0.0
LnGrp LOS	B	A	B				A	B	A	C	A	A
Approach Vol, veh/h		207						742			490	
Approach Delay, s/veh		19.1						13.4			9.1	
Approach LOS		B						B			A	
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	8.1	21.1		10.5			29.2					
Change Period (Y+Rc), s	4.0	4.0		4.0			4.0					
Max Green Setting (Gmax), s	16.0	22.0		20.0			42.0					
Max Q Clear Time (g_c+I1), s	5.0	14.4		6.4			5.4					
Green Ext Time (p_c), s	0.2	2.7		0.8			2.1					
Intersection Summary												
HCM 6th Ctrl Delay			12.8									
HCM 6th LOS			B									

Manteca Rotten Robbie

2: S. Airport Way & SR 120 WB On Ramp/SR 120 WB Off Ramp

Existing Condition-AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↷	↷
Traffic Volume (veh/h)	0	0	0	75	1	272	198	522	0	0	337	406
Future Volume (veh/h)	0	0	0	75	1	272	198	522	0	0	337	406
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
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1841	1841	1841	1841	1841	0	0	1841	1841
Adj Flow Rate, veh/h				89	1	9	236	621	0	0	401	110
Peak Hour Factor				0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %				4	4	4	4	4	0	0	4	4
Cap, veh/h				131	1	118	319	1197	0	0	611	517
Arrive On Green				0.08	0.08	0.08	0.18	0.65	0.00	0.00	0.33	0.33
Sat Flow, veh/h				1735	19	1560	1753	1841	0	0	1841	1560
Grp Volume(v), veh/h				90	0	9	236	621	0	0	401	110
Grp Sat Flow(s),veh/h/ln				1754	0	1560	1753	1841	0	0	1841	1560
Q Serve(g_s), s				1.5	0.0	0.2	3.7	5.2	0.0	0.0	5.4	1.5
Cycle Q Clear(g_c), s				1.5	0.0	0.2	3.7	5.2	0.0	0.0	5.4	1.5
Prop In Lane				0.99		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				133	0	118	319	1197	0	0	611	517
V/C Ratio(X)				0.68	0.00	0.08	0.74	0.52	0.00	0.00	0.66	0.21
Avail Cap(c_a), veh/h				961	0	855	1081	2900	0	0	1513	1282
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				13.2	0.0	12.5	11.3	2.7	0.0	0.0	8.3	7.0
Incr Delay (d2), s/veh				5.9	0.0	0.3	3.4	0.3	0.0	0.0	1.2	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.6	0.0	0.0	1.2	0.1	0.0	0.0	1.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				19.1	0.0	12.8	14.7	3.0	0.0	0.0	9.5	7.2
LnGrp LOS				B	A	B	B	A	A	A	A	A
Approach Vol, veh/h					99			857			511	
Approach Delay, s/veh					18.5			6.2			9.0	
Approach LOS					B			A			A	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		23.0			9.3	13.7		6.2				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		46.0			18.0	24.0		16.0				
Max Q Clear Time (g_c+I1), s		7.2			5.7	7.4		3.5				
Green Ext Time (p_c), s		4.4			0.5	2.4		0.3				
Intersection Summary												
HCM 6th Ctrl Delay					8.1							
HCM 6th LOS					A							

Manteca Rotten Robbie
3: S. Airport Way & Daniels St

Existing Condition-AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	29	151	308	69	46	175	433	186	22	284	66
Future Volume (veh/h)	57	29	151	308	69	46	175	433	186	22	284	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	68	35	7	367	82	1	208	515	100	26	338	31
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	145	105	218	295	187	158	280	2039	891	40	1831	817
Arrive On Green	0.04	0.06	0.06	0.09	0.10	0.10	0.08	0.58	0.58	0.02	0.52	0.52
Sat Flow, veh/h	3401	1841	1560	3401	1841	1560	3401	3497	1528	1753	3497	1560
Grp Volume(v), veh/h	68	35	7	367	82	1	208	515	100	26	338	31
Grp Sat Flow(s),veh/h/ln	1700	1841	1560	1700	1841	1560	1700	1749	1528	1753	1749	1560
Q Serve(g_s), s	1.3	1.2	0.3	5.9	2.8	0.0	4.1	4.9	2.0	1.0	3.5	0.7
Cycle Q Clear(g_c), s	1.3	1.2	0.3	5.9	2.8	0.0	4.1	4.9	2.0	1.0	3.5	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	105	218	295	187	158	280	2039	891	40	1831	817
V/C Ratio(X)	0.47	0.33	0.03	1.24	0.44	0.01	0.74	0.25	0.11	0.65	0.18	0.04
Avail Cap(c_a), veh/h	295	1243	1181	295	1243	1053	280	2039	891	144	1831	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.8	30.8	25.3	31.0	28.7	27.5	30.5	6.9	6.3	33.0	8.5	7.9
Incr Delay (d2), s/veh	2.4	1.8	0.1	134.9	1.6	0.0	10.2	0.3	0.3	16.3	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.6	0.1	7.9	1.3	0.0	1.9	1.5	0.6	0.6	1.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	32.6	25.3	166.0	30.3	27.5	40.7	7.2	6.6	49.3	8.8	8.0
LnGrp LOS	C	C	C	F	C	C	D	A	A	D	A	A
Approach Vol, veh/h	110			450			823			395		
Approach Delay, s/veh	33.1			141.0			15.6			11.4		
Approach LOS	C			F			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.0	44.0	10.0	8.0	10.0	40.0	7.0	11.0				
Change Period (Y+Rc), s	4.4	4.4	4.1	4.1	4.4	4.4	4.1	4.1				
Max Green Setting (Gmax), s	5.6	35.6	5.9	45.9	5.6	35.6	5.9	45.9				
Max Q Clear Time (g_c+I), s	13.0	6.9	7.9	3.2	6.1	5.5	3.3	4.8				
Green Ext Time (p_c), s	0.0	3.8	0.0	0.2	0.0	2.2	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	47.5
HCM 6th LOS	D

Manteca Rotten Robbie
4: S. Airport Way & Wawona St

Existing Condition-AM Peak Hour

Intersection

Int Delay, s/veh 3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	74	38	365	171	25	298
Future Vol, veh/h	74	38	365	171	25	298
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	88	45	435	204	30	355

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	850	435	0
Stage 1	435	-	-
Stage 2	415	-	-
Critical Hdwy	6.44	6.24	-
Critical Hdwy Stg 1	5.44	-	-
Critical Hdwy Stg 2	5.44	-	-
Follow-up Hdwy	3.536	3.336	-
Pot Cap-1 Maneuver	328	617	-
Stage 1	648	-	-
Stage 2	662	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	317	617	-
Mov Cap-2 Maneuver	317	-	-
Stage 1	648	-	-
Stage 2	639	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.5	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBTWBLn1	SBL	SBT
Capacity (veh/h)	- 380	1114	-
HCM Lane V/C Ratio	- 0.351	0.027	-
HCM Control Delay (s)	- 19.5	8.3	0
HCM Lane LOS	- C	A	A
HCM 95th %tile Q(veh)	- 1.5	0.1	-

Manteca Rotten Robbie
5: S. Airport Way & Yosemite Avenue

Existing Condition-AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	163	30	68	247	195	117	197	89	181	225	119
Future Volume (veh/h)	41	163	30	68	247	195	117	197	89	181	225	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	44	175	15	73	266	49	126	212	15	195	242	32
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	66	533	45	95	530	96	159	340	288	250	435	369
Arrive On Green	0.04	0.17	0.17	0.05	0.18	0.18	0.09	0.19	0.19	0.14	0.24	0.24
Sat Flow, veh/h	1725	3201	271	1725	2896	525	1725	1811	1535	1725	1811	1535
Grp Volume(v), veh/h	44	93	97	73	156	159	126	212	15	195	242	32
Grp Sat Flow(s),veh/h/ln	1725	1721	1752	1725	1721	1700	1725	1811	1535	1725	1811	1535
Q Serve(g_s), s	1.0	2.0	2.0	1.7	3.4	3.5	3.0	4.4	0.3	4.5	4.8	0.7
Cycle Q Clear(g_c), s	1.0	2.0	2.0	1.7	3.4	3.5	3.0	4.4	0.3	4.5	4.8	0.7
Prop In Lane	1.00		0.15	1.00		0.31	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	66	286	292	95	315	311	159	340	288	250	435	369
V/C Ratio(X)	0.66	0.33	0.33	0.77	0.50	0.51	0.79	0.62	0.05	0.78	0.56	0.09
Avail Cap(c_a), veh/h	217	1260	1283	217	1276	1261	234	1563	1325	443	1783	1511
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(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	15.1	15.2	19.2	15.1	15.2	18.3	15.4	13.7	17.0	13.7	12.2
Incr Delay (d2), s/veh	10.8	0.7	0.7	12.3	1.2	1.3	10.8	1.9	0.1	5.2	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.6	0.7	0.9	1.1	1.1	1.5	1.7	0.1	1.9	1.8	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.4	15.8	15.8	31.5	16.3	16.5	29.1	17.3	13.8	22.3	14.8	12.3
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		234			388			353			469	
Approach Delay, s/veh		18.6			19.3			21.4			17.7	
Approach LOS		B			B			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.4	12.1	7.1	11.7	8.2	14.3	6.4	12.4				
Change Period (Y+Rc), s	4.4	4.4	4.8	4.8	4.4	4.4	4.8	* 4.8				
Max Green Setting (Gmax), s	10.6	35.6	5.2	30.2	5.6	40.6	5.2	* 31				
Max Q Clear Time (g_c+I1), s	6.5	6.4	3.7	4.0	5.0	6.8	3.0	5.5				
Green Ext Time (p_c), s	0.2	1.3	0.0	0.9	0.0	1.6	0.0	1.6				

Intersection Summary

HCM 6th Ctrl Delay	19.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Manteca Rotten Robbie

1: S. Airport Way & SR 120 EB Off ramp/SR 120 EB On ramp

Existing Condition-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	440	3	253	0	0	0	0	450	99	275	624	0
Future Volume (veh/h)	440	3	253	0	0	0	0	450	99	275	624	0
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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	463	3	98				0	474	45	289	657	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	514	3	460				0	528	448	353	1023	0
Arrive On Green	0.29	0.29	0.29				0.00	0.28	0.28	0.20	0.55	0.00
Sat Flow, veh/h	1770	11	1585				0	1870	1585	1781	1870	0
Grp Volume(v), veh/h	466	0	98				0	474	45	289	657	0
Grp Sat Flow(s),veh/h/ln	1782	0	1585				0	1870	1585	1781	1870	0
Q Serve(g_s), s	15.1	0.0	2.8				0.0	14.7	1.3	9.3	14.8	0.0
Cycle Q Clear(g_c), s	15.1	0.0	2.8				0.0	14.7	1.3	9.3	14.8	0.0
Prop In Lane	0.99		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	517	0	460				0	528	448	353	1023	0
V/C Ratio(X)	0.90	0.00	0.21				0.00	0.90	0.10	0.82	0.64	0.00
Avail Cap(c_a), veh/h	1040	0	925				0	843	714	711	1023	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.5	0.0	16.2				0.0	20.8	15.9	23.1	9.5	0.0
Incr Delay (d2), s/veh	2.4	0.0	0.1				0.0	5.2	0.0	4.7	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	0.9				0.0	6.2	0.4	3.9	4.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	0.0	16.2				0.0	26.0	16.0	27.8	10.6	0.0
LnGrp LOS	C	A	B				A	C	B	C	B	A
Approach Vol, veh/h		564						519			946	
Approach Delay, s/veh		21.8						25.1			15.9	
Approach LOS		C						C			B	
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	15.9	21.9		22.4			37.8					
Change Period (Y+Rc), s	4.0	4.9		4.9			4.9					
Max Green Setting (Gmax), s	24.0	27.1		35.1			31.1					
Max Q Clear Time (g_c+I1), s	11.3	16.7		17.1			16.8					
Green Ext Time (p_c), s	0.7	0.3		0.3			0.5					
Intersection Summary												
HCM 6th Ctrl Delay			19.9									
HCM 6th LOS			B									

Manteca Rotten Robbie

2: S. Airport Way & SR 120 WB On Ramp/SR 120 WB Off Ramp

Existing Condition-PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	165	0	358	94	796	0	0	734	341
Future Volume (veh/h)	0	0	0	165	0	358	94	796	0	0	734	341
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
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1885	1885	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				174	0	251	99	838	0	0	773	188
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	1	1	1	1	0	0	1	1
Cap, veh/h				345	0	307	161	1152	0	0	831	704
Arrive On Green				0.19	0.00	0.19	0.09	0.61	0.00	0.00	0.44	0.44
Sat Flow, veh/h				1795	0	1598	1795	1885	0	0	1885	1598
Grp Volume(v), veh/h				174	0	251	99	838	0	0	773	188
Grp Sat Flow(s),veh/h/ln				1795	0	1598	1795	1885	0	0	1885	1598
Q Serve(g_s), s				4.3	0.0	7.5	2.6	15.5	0.0	0.0	19.4	3.7
Cycle Q Clear(g_c), s				4.3	0.0	7.5	2.6	15.5	0.0	0.0	19.4	3.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				345	0	307	161	1152	0	0	831	704
V/C Ratio(X)				0.50	0.00	0.82	0.61	0.73	0.00	0.00	0.93	0.27
Avail Cap(c_a), veh/h				1085	0	965	541	1177	0	0	1177	998
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				18.0	0.0	19.3	21.8	6.8	0.0	0.0	13.2	8.8
Incr Delay (d2), s/veh				0.4	0.0	2.0	3.7	1.9	0.0	0.0	8.4	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.5	0.0	2.4	1.1	3.7	0.0	0.0	7.7	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.4	0.0	21.3	25.6	8.7	0.0	0.0	21.6	8.9
LnGrp LOS				B	A	C	C	A	A	A	C	A
Approach Vol, veh/h					425			937			961	
Approach Delay, s/veh					20.1			10.5			19.1	
Approach LOS					C			B			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.3			8.5	26.8		14.5				
Change Period (Y+Rc), s		4.9			4.0	4.9		4.9				
Max Green Setting (Gmax), s		31.1			15.0	31.1		30.1				
Max Q Clear Time (g_c+I1), s		17.5			4.6	21.4		9.5				
Green Ext Time (p_c), s		0.7			0.1	0.6		0.1				
Intersection Summary												
HCM 6th Ctrl Delay											15.8	
HCM 6th LOS											B	

Manteca Rotten Robbie
3: S. Airport Way & Daniels St

Existing Condition-PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑	↱	↰↱	↑	↱	↰↱	↰↱	↱	↰	↰↱	↱
Traffic Volume (veh/h)	309	156	492	214	130	49	529	360	265	53	369	362
Future Volume (veh/h)	309	156	492	214	130	49	529	360	265	53	369	362
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	325	164	417	225	137	6	557	379	132	56	388	130
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	389	477	681	283	420	356	608	1720	765	73	1240	553
Arrive On Green	0.11	0.25	0.25	0.08	0.22	0.22	0.17	0.48	0.48	0.04	0.35	0.35
Sat Flow, veh/h	3483	1885	1588	3483	1885	1598	3483	3582	1593	1795	3582	1598
Grp Volume(v), veh/h	325	164	417	225	137	6	557	379	132	56	388	130
Grp Sat Flow(s),veh/h/ln	1742	1885	1588	1742	1885	1598	1742	1791	1593	1795	1791	1598
Q Serve(g_s), s	10.7	8.3	23.9	7.4	7.1	0.3	18.4	7.2	5.5	3.6	9.3	6.8
Cycle Q Clear(g_c), s	10.7	8.3	23.9	7.4	7.1	0.3	18.4	7.2	5.5	3.6	9.3	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	389	477	681	283	420	356	608	1720	765	73	1240	553
V/C Ratio(X)	0.84	0.34	0.61	0.79	0.33	0.02	0.92	0.22	0.17	0.77	0.31	0.24
Avail Cap(c_a), veh/h	472	818	968	324	738	625	612	1720	765	162	1240	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	35.8	26.1	52.9	38.2	35.6	47.6	17.7	17.3	55.7	28.1	27.3
Incr Delay (d2), s/veh	10.6	0.4	0.9	11.4	0.4	0.0	18.6	0.3	0.5	15.7	0.7	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	3.9	9.1	3.7	3.4	0.1	9.4	2.9	2.1	1.9	4.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.6	36.3	27.0	64.3	38.7	35.6	66.2	18.0	17.8	71.4	28.8	28.3
LnGrp LOS	E	D	C	E	D	D	E	B	B	E	C	C
Approach Vol, veh/h	906		368			1068			574			
Approach Delay, s/veh	41.1		54.3			43.1			32.8			
Approach LOS	D		D			D			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	60.7	13.6	33.8	24.9	45.0	17.2	30.2				
Change Period (Y+Rc), s	4.4	4.4	4.1	4.1	4.4	4.4	4.1	4.1				
Max Green Setting (Gmax), s	10.6	50.6	10.9	50.9	20.6	40.6	15.9	45.9				
Max Q Clear Time (g_c+I), s	10.6	9.2	9.4	25.9	20.4	11.3	12.7	9.1				
Green Ext Time (p_c), s	0.0	2.9	0.1	2.5	0.0	2.9	0.4	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			41.9									
HCM 6th LOS			D									

Manteca Rotten Robbie
4: S. Airport Way & Wawona St

Existing Condition-PM Peak Hour

Intersection						
Int Delay, s/veh	2.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	27	593	125	37	741
Future Vol, veh/h	43	27	593	125	37	741
Conflicting Peds, #/hr	0	0	0	6	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	45	28	624	132	39	780
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1482	624	0	-	624	0
Stage 1	624	-	-	-	-	-
Stage 2	858	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	139	487	-	0	962	-
Stage 1	536	-	-	0	-	-
Stage 2	417	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	129	487	-	-	962	-
Mov Cap-2 Maneuver	129	-	-	-	-	-
Stage 1	536	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	38.2	0	0.4			
HCM LOS	E					
Minor Lane/Major Mvmt	NBTWBLn1	SBL	SBT			
Capacity (veh/h)	- 180	962	-			
HCM Lane V/C Ratio	- 0.409	0.04	-			
HCM Control Delay (s)	- 38.2	8.9	0			
HCM Lane LOS	- E	A	A			
HCM 95th %tile Q(veh)	- 1.8	0.1	-			

Manteca Rotten Robbie
5: S. Airport Way & Yosemite Avenue

Existing Condition-PM Peak Hour

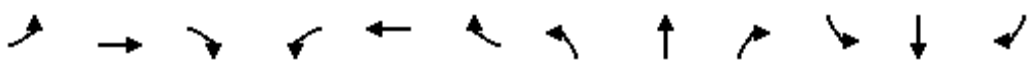
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	357	154	219	266	227	88	364	168	166	405	58
Future Volume (veh/h)	179	357	154	219	266	227	88	364	168	166	405	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	192	384	120	235	286	95	95	391	39	178	435	19
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	237	536	165	285	598	194	122	493	418	222	599	505
Arrive On Green	0.13	0.20	0.20	0.16	0.23	0.23	0.07	0.26	0.26	0.12	0.32	0.32
Sat Flow, veh/h	1795	2675	824	1795	2636	854	1795	1885	1598	1795	1885	1589
Grp Volume(v), veh/h	192	255	249	235	192	189	95	391	39	178	435	19
Grp Sat Flow(s),veh/h/ln	1795	1791	1708	1795	1791	1699	1795	1885	1598	1795	1885	1589
Q Serve(g_s), s	7.5	9.6	9.8	9.1	6.7	7.0	3.8	13.9	1.3	6.9	14.7	0.6
Cycle Q Clear(g_c), s	7.5	9.6	9.8	9.1	6.7	7.0	3.8	13.9	1.3	6.9	14.7	0.6
Prop In Lane	1.00		0.48	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	358	342	285	406	386	122	493	418	222	599	505
V/C Ratio(X)	0.81	0.71	0.73	0.82	0.47	0.49	0.78	0.79	0.09	0.80	0.73	0.04
Avail Cap(c_a), veh/h	379	627	598	504	761	722	140	932	790	389	1193	1006
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	26.9	27.0	29.3	24.1	24.2	33.0	24.8	20.1	30.7	21.8	17.0
Incr Delay (d2), s/veh	6.8	2.6	3.0	5.9	0.9	1.0	21.4	2.9	0.1	6.5	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	4.0	3.9	4.0	2.7	2.6	2.3	6.0	0.5	3.2	6.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	29.5	29.9	35.3	25.0	25.2	54.4	27.7	20.2	37.2	23.5	17.0
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	C	B
Approach Vol, veh/h		696			616			525			632	
Approach Delay, s/veh		31.8			29.0			32.0			27.2	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.3	23.2	16.2	19.2	9.3	27.3	14.3	21.1				
Change Period (Y+Rc), s	4.4	4.4	4.8	4.8	4.4	4.4	4.8	* 4.8				
Max Green Setting (Gmax), s	15.6	35.6	20.2	25.2	5.6	45.6	15.2	* 31				
Max Q Clear Time (g_c+I1), s	8.9	15.9	11.1	11.8	5.8	16.7	9.5	9.0				
Green Ext Time (p_c), s	0.2	2.2	0.4	2.3	0.0	2.7	0.2	2.0				
Intersection Summary												
HCM 6th Ctrl Delay			29.9									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Appendix B



Manteca Rotten Robbie

1: S. Airport Way & SR 120 EB Off ramp/SR 120 EB On ramp Existing Plus Project Condition-AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↶	↷					↶	↷	↷	↶	
Traffic Volume (veh/h)	182	1	78	0	0	0	0	553	169	126	300	0
Future Volume (veh/h)	182	1	78	0	0	0	0	553	169	126	300	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841				0	1841	1841	1841	1841	0
Adj Flow Rate, veh/h	217	1	7				0	658	82	150	357	0
Peak Hour Factor	0.84	0.84	0.84				0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4				0	4	4	4	4	0
Cap, veh/h	301	1	269				0	784	650	198	1169	0
Arrive On Green	0.17	0.17	0.17				0.00	0.43	0.43	0.11	0.64	0.00
Sat Flow, veh/h	1745	8	1560				0	1841	1526	1753	1841	0
Grp Volume(v), veh/h	218	0	7				0	658	82	150	357	0
Grp Sat Flow(s),veh/h/ln	1753	0	1560				0	1841	1526	1753	1841	0
Q Serve(g_s), s	4.9	0.0	0.2				0.0	13.3	1.4	3.5	3.7	0.0
Cycle Q Clear(g_c), s	4.9	0.0	0.2				0.0	13.3	1.4	3.5	3.7	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	303	0	269				0	784	650	198	1169	0
V/C Ratio(X)	0.72	0.00	0.03				0.00	0.84	0.13	0.76	0.31	0.00
Avail Cap(c_a), veh/h	842	0	749				0	972	806	674	1856	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.3	0.0	14.3				0.0	10.7	7.2	17.9	3.4	0.0
Incr Delay (d2), s/veh	3.2	0.0	0.0				0.0	5.5	0.1	5.8	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.0				0.0	4.6	0.3	1.5	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.5	0.0	14.4				0.0	16.1	7.3	23.7	3.6	0.0
LnGrp LOS	B	A	B				A	B	A	C	A	A
Approach Vol, veh/h		225						740			507	
Approach Delay, s/veh		19.3						15.2			9.5	
Approach LOS		B						B			A	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.7	21.7		11.2		30.5						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	16.0	22.0		20.0		42.0						
Max Q Clear Time (g_c+I1), s	5.5	15.3		6.9		5.7						
Green Ext Time (p_c), s	0.3	2.5		0.9		2.1						
Intersection Summary												
HCM 6th Ctrl Delay			13.9									
HCM 6th LOS			B									

Manteca Rotten Robbie

2: S. Airport Way & SR 120 WB On Ramp/SR 120 WB Off Ramp Existing Plus Project Condition-AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↰	↰	↰			↱	↱
Traffic Volume (veh/h)	0	0	0	75	1	288	198	537	0	0	351	422
Future Volume (veh/h)	0	0	0	75	1	288	198	537	0	0	351	422
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
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1841	1841	1841	1841	1841	0	0	1841	1841
Adj Flow Rate, veh/h				89	1	41	236	639	0	0	418	115
Peak Hour Factor				0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %				4	4	4	4	4	0	0	4	4
Cap, veh/h				152	2	137	318	1197	0	0	622	527
Arrive On Green				0.09	0.09	0.09	0.18	0.65	0.00	0.00	0.34	0.34
Sat Flow, veh/h				1735	19	1560	1753	1841	0	0	1841	1560
Grp Volume(v), veh/h				90	0	41	236	639	0	0	418	115
Grp Sat Flow(s),veh/h/ln				1754	0	1560	1753	1841	0	0	1841	1560
Q Serve(g_s), s				1.5	0.0	0.8	3.9	5.7	0.0	0.0	5.9	1.6
Cycle Q Clear(g_c), s				1.5	0.0	0.8	3.9	5.7	0.0	0.0	5.9	1.6
Prop In Lane				0.99		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				154	0	137	318	1197	0	0	622	527
V/C Ratio(X)				0.58	0.00	0.30	0.74	0.53	0.00	0.00	0.67	0.22
Avail Cap(c_a), veh/h				919	0	817	1033	2772	0	0	1446	1226
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				13.4	0.0	13.0	11.8	2.9	0.0	0.0	8.7	7.2
Incr Delay (d2), s/veh				3.5	0.0	1.2	3.4	0.4	0.0	0.0	1.3	0.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.5	0.0	0.2	1.3	0.1	0.0	0.0	1.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				16.9	0.0	14.3	15.3	3.2	0.0	0.0	9.9	7.4
LnGrp LOS				B	A	B	B	A	A	A	A	A
Approach Vol, veh/h					131			875			533	
Approach Delay, s/veh					16.1			6.5			9.4	
Approach LOS					B			A			A	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		23.9			9.5	14.3		6.7				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		46.0			18.0	24.0		16.0				
Max Q Clear Time (g_c+I1), s		7.7			5.9	7.9		3.5				
Green Ext Time (p_c), s		4.6			0.5	2.5		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				8.3								
HCM 6th LOS				A								

Manteca Rotten Robbie
3: S. Airport Way & Daniels St

Existing Plus Project Condition-AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	29	151	308	69	47	175	464	186	23	314	68
Future Volume (veh/h)	60	29	151	308	69	47	175	464	186	23	314	68
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	71	35	7	367	82	1	208	552	100	27	374	32
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	148	106	218	295	185	157	280	2037	890	41	1831	817
Arrive On Green	0.04	0.06	0.06	0.09	0.10	0.10	0.08	0.58	0.58	0.02	0.52	0.52
Sat Flow, veh/h	3401	1841	1560	3401	1841	1560	3401	3497	1528	1753	3497	1560
Grp Volume(v), veh/h	71	35	7	367	82	1	208	552	100	27	374	32
Grp Sat Flow(s),veh/h/ln1700	1841	1560	1700	1841	1560	1700	1749	1528	1753	1749	1560	1560
Q Serve(g_s), s	1.4	1.2	0.3	5.9	2.9	0.0	4.1	5.3	2.0	1.0	3.9	0.7
Cycle Q Clear(g_c), s	1.4	1.2	0.3	5.9	2.9	0.0	4.1	5.3	2.0	1.0	3.9	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	106	218	295	185	157	280	2037	890	41	1831	817
V/C Ratio(X)	0.48	0.33	0.03	1.24	0.44	0.01	0.74	0.27	0.11	0.66	0.20	0.04
Avail Cap(c_a), veh/h	295	1242	1181	295	1242	1053	280	2037	890	144	1831	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.8	30.8	25.3	31.1	28.8	27.5	30.5	7.0	6.3	32.9	8.6	7.9
Incr Delay (d2), s/veh	2.4	1.8	0.1	135.0	1.7	0.0	10.2	0.3	0.3	16.2	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.6	0.1	7.9	1.3	0.0	1.9	1.6	0.6	0.6	1.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	32.6	25.3	166.0	30.4	27.5	40.7	7.4	6.6	49.2	8.9	8.0
LnGrp LOS	C	C	C	F	C	C	D	A	A	D	A	A
Approach Vol, veh/h	113			450			860			433		
Approach Delay, s/veh	33.1			141.0			15.3			11.3		
Approach LOS	C			F			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s6.0	44.0	10.0	8.0	10.0	40.0	7.1	10.9					
Change Period (Y+Rc), s 4.4	4.4	4.1	4.1	4.4	4.4	4.1	4.1					
Max Green Setting (Gmax), s5.6	35.6	5.9	45.9	5.6	35.6	5.9	45.9					
Max Q Clear Time (g_c+I), s13.0	7.3	7.9	3.2	6.1	5.9	3.4	4.9					
Green Ext Time (p_c), s 0.0	4.0	0.0	0.2	0.0	2.5	0.0	0.4					
Intersection Summary												
HCM 6th Ctrl Delay	46.0											
HCM 6th LOS	D											

Manteca Rotten Robbie
4: S. Airport Way & Wawona St

Existing Plus Project Condition-AM Peak Hour

Intersection						
Int Delay, s/veh	3.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	74	48	365	171	29	306
Future Vol, veh/h	74	48	365	171	29	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	88	57	435	204	35	364

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	869	435	0
Stage 1	435	-	-
Stage 2	434	-	-
Critical Hdwy	6.44	6.24	-
Critical Hdwy Stg 1	5.44	-	-
Critical Hdwy Stg 2	5.44	-	-
Follow-up Hdwy	3.536	3.336	-
Pot Cap-1 Maneuver	320	617	-
Stage 1	648	-	-
Stage 2	649	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	308	617	-
Mov Cap-2 Maneuver	308	-	-
Stage 1	648	-	-
Stage 2	624	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBTWBLn1	SBL	SBT
Capacity (veh/h)	- 384	1114	-
HCM Lane V/C Ratio	- 0.378	0.031	-
HCM Control Delay (s)	- 20	8.3	0
HCM Lane LOS	- C	A	A
HCM 95th %tile Q(veh)	- 1.7	0.1	-

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	163	31	73	247	195	118	202	93	181	231	119
Future Volume (veh/h)	41	163	31	73	247	195	118	202	93	181	231	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	44	175	15	78	266	49	127	217	16	195	248	32
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	66	524	44	99	529	96	160	345	292	250	439	372
Arrive On Green	0.04	0.16	0.16	0.06	0.18	0.18	0.09	0.19	0.19	0.14	0.24	0.24
Sat Flow, veh/h	1725	3201	271	1725	2896	525	1725	1811	1535	1725	1811	1535
Grp Volume(v), veh/h	44	93	97	78	156	159	127	217	16	195	248	32
Grp Sat Flow(s),veh/h/ln	1725	1721	1752	1725	1721	1700	1725	1811	1535	1725	1811	1535
Q Serve(g_s), s	1.0	2.0	2.0	1.9	3.4	3.5	3.0	4.6	0.4	4.5	5.0	0.7
Cycle Q Clear(g_c), s	1.0	2.0	2.0	1.9	3.4	3.5	3.0	4.6	0.4	4.5	5.0	0.7
Prop In Lane	1.00		0.15	1.00		0.31	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	66	282	287	99	314	310	160	345	292	250	439	372
V/C Ratio(X)	0.67	0.33	0.34	0.79	0.50	0.51	0.79	0.63	0.05	0.78	0.56	0.09
Avail Cap(c_a), veh/h	216	1253	1276	216	1270	1254	233	1555	1318	441	1773	1503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	15.3	15.3	19.3	15.2	15.3	18.4	15.4	13.7	17.1	13.8	12.2
Incr Delay (d2), s/veh	10.9	0.7	0.7	13.1	1.2	1.3	11.1	1.9	0.1	5.3	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.6	0.7	1.0	1.1	1.1	1.5	1.8	0.1	1.9	1.8	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.6	16.0	16.0	32.4	16.5	16.6	29.5	17.3	13.8	22.4	14.9	12.2
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		234			393			360			475	
Approach Delay, s/veh		18.8			19.7			21.5			17.8	
Approach LOS		B			B			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.4	12.3	7.2	11.6	8.2	14.5	6.4	12.4				
Change Period (Y+Rc), s	4.4	4.4	4.8	4.8	4.4	4.4	4.8	* 4.8				
Max Green Setting (Gmax), s	10.6	35.6	5.2	30.2	5.6	40.6	5.2	* 31				
Max Q Clear Time (g_c+I1), s	6.5	6.6	3.9	4.0	5.0	7.0	3.0	5.5				
Green Ext Time (p_c), s	0.2	1.3	0.0	0.9	0.0	1.6	0.0	1.6				

Intersection Summary

HCM 6th Ctrl Delay 19.4

HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Manteca Rotten Robbie

1: S. Airport Way & SR 120 EB Off ramp/SR 120 EB On ramp Existing Plus Project Condition-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	462	3	253	0	0	0	0	455	99	296	628	0
Future Volume (veh/h)	462	3	253	0	0	0	0	455	99	296	628	0
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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	486	3	101				0	479	45	312	661	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	532	3	476				0	528	447	371	1031	0
Arrive On Green	0.30	0.30	0.30				0.00	0.28	0.28	0.21	0.55	0.00
Sat Flow, veh/h	1771	11	1585				0	1870	1585	1781	1870	0
Grp Volume(v), veh/h	489	0	101				0	479	45	312	661	0
Grp Sat Flow(s),veh/h/ln	1782	0	1585				0	1870	1585	1781	1870	0
Q Serve(g_s), s	17.5	0.0	3.1				0.0	16.3	1.4	11.1	16.2	0.0
Cycle Q Clear(g_c), s	17.5	0.0	3.1				0.0	16.3	1.4	11.1	16.2	0.0
Prop In Lane	0.99		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	535	0	476				0	528	447	371	1031	0
V/C Ratio(X)	0.91	0.00	0.21				0.00	0.91	0.10	0.84	0.64	0.00
Avail Cap(c_a), veh/h	948	0	843				0	768	651	648	1031	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.3	0.0	17.2				0.0	22.8	17.5	25.1	10.3	0.0
Incr Delay (d2), s/veh	3.6	0.0	0.1				0.0	8.5	0.0	5.2	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.0	1.0				0.0	7.6	0.5	4.8	5.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	0.0	17.3				0.0	31.4	17.5	30.3	11.3	0.0
LnGrp LOS	C	A	B				A	C	B	C	B	A
Approach Vol, veh/h		590						524			973	
Approach Delay, s/veh		24.4						30.2			17.4	
Approach LOS		C						C			B	
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	17.7	23.5		24.7			41.3					
Change Period (Y+Rc), s	4.0	4.9		4.9			4.9					
Max Green Setting (Gmax), s	24.0	27.1		35.1			31.1					
Max Q Clear Time (g_c+I1), s	13.1	18.3		19.5			18.2					
Green Ext Time (p_c), s	0.7	0.3		0.4			0.5					
Intersection Summary												
HCM 6th Ctrl Delay			22.6									
HCM 6th LOS			C									

Manteca Rotten Robbie

2: S. Airport Way & SR 120 WB On Ramp/SR 120 WB Off Ramp Existing Plus Project Condition-PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	165	0	381	94	823	0	0	759	362
Future Volume (veh/h)	0	0	0	165	0	381	94	823	0	0	759	362
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
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1885	1885	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				174	0	286	99	866	0	0	799	202
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	1	1	1	1	0	0	1	1
Cap, veh/h				378	0	337	153	1149	0	0	850	720
Arrive On Green				0.21	0.00	0.21	0.09	0.61	0.00	0.00	0.45	0.45
Sat Flow, veh/h				1795	0	1598	1795	1885	0	0	1885	1598
Grp Volume(v), veh/h				174	0	286	99	866	0	0	799	202
Grp Sat Flow(s),veh/h/ln				1795	0	1598	1795	1885	0	0	1885	1598
Q Serve(g_s), s				4.6	0.0	9.4	2.9	18.1	0.0	0.0	22.0	4.3
Cycle Q Clear(g_c), s				4.6	0.0	9.4	2.9	18.1	0.0	0.0	22.0	4.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				378	0	337	153	1149	0	0	850	720
V/C Ratio(X)				0.46	0.00	0.85	0.65	0.75	0.00	0.00	0.94	0.28
Avail Cap(c_a), veh/h				991	0	881	494	1149	0	0	1075	911
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				18.8	0.0	20.7	24.1	7.7	0.0	0.0	14.3	9.4
Incr Delay (d2), s/veh				0.3	0.0	2.3	4.5	2.6	0.0	0.0	12.1	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.6	0.0	3.1	1.3	4.9	0.0	0.0	9.8	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				19.1	0.0	23.0	28.6	10.2	0.0	0.0	26.3	9.5
LnGrp LOS				B	A	C	C	B	A	A	C	A
Approach Vol, veh/h					460			965			1001	
Approach Delay, s/veh					21.6			12.1			22.9	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		38.2			8.7	29.5		16.4				
Change Period (Y+Rc), s		4.9			4.0	4.9		4.9				
Max Green Setting (Gmax), s		31.1			15.0	31.1		30.1				
Max Q Clear Time (g_c+I1), s		20.1			4.9	24.0		11.4				
Green Ext Time (p_c), s		0.7			0.1	0.6		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				18.4								
HCM 6th LOS				B								

Manteca Rotten Robbie
3: S. Airport Way & Daniels St

Existing Plus Project Condition-PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑	↰	↰↱	↑	↰	↰↱	↑↑	↰	↰	↑↑	↰
Traffic Volume (veh/h)	311	156	492	214	130	50	529	410	265	54	415	364
Future Volume (veh/h)	311	156	492	214	130	50	529	410	265	54	415	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	327	164	437	225	137	6	557	432	132	57	437	131
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	389	495	693	282	437	370	602	1693	753	74	1221	545
Arrive On Green	0.11	0.26	0.26	0.08	0.23	0.23	0.17	0.47	0.47	0.04	0.34	0.34
Sat Flow, veh/h	3483	1885	1588	3483	1885	1598	3483	3582	1593	1795	3582	1598
Grp Volume(v), veh/h	327	164	437	225	137	6	557	432	132	57	437	131
Grp Sat Flow(s),veh/h/ln	1742	1885	1588	1742	1885	1598	1742	1791	1593	1795	1791	1598
Q Serve(g_s), s	11.0	8.4	25.5	7.6	7.2	0.3	18.7	8.6	5.7	3.7	10.9	7.0
Cycle Q Clear(g_c), s	11.0	8.4	25.5	7.6	7.2	0.3	18.7	8.6	5.7	3.7	10.9	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	389	495	693	282	437	370	602	1693	753	74	1221	545
V/C Ratio(X)	0.84	0.33	0.63	0.80	0.31	0.02	0.92	0.26	0.18	0.77	0.36	0.24
Avail Cap(c_a), veh/h	465	806	955	319	727	616	602	1693	753	160	1221	545
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	35.5	26.2	53.8	37.9	35.3	48.5	18.8	18.1	56.5	29.5	28.2
Incr Delay (d2), s/veh	11.2	0.4	1.0	11.9	0.4	0.0	20.2	0.4	0.5	15.5	0.8	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	3.9	9.7	3.8	3.4	0.1	9.7	3.5	2.2	2.0	4.7	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.1	35.9	27.1	65.7	38.3	35.3	68.7	19.2	18.6	72.0	30.3	29.2
LnGrp LOS	E	D	C	E	D	D	E	B	B	E	C	C
Approach Vol, veh/h	928					368		1121		625		
Approach Delay, s/veh	41.4					55.0		43.7		33.9		
Approach LOS	D					D		D		C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.3	60.7	13.8	35.3	25.0	45.0	17.4	31.7				
Change Period (Y+Rc), s	4.4	4.4	4.1	4.1	4.4	4.4	4.1	4.1				
Max Green Setting (Gmax), s	10.6	50.6	10.9	50.9	20.6	40.6	15.9	45.9				
Max Q Clear Time (g_c+I), s	10.6	10.6	9.6	27.5	20.7	12.9	13.0	9.2				
Green Ext Time (p_c), s	0.0	3.3	0.1	2.6	0.0	3.2	0.3	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			42.3									
HCM 6th LOS			D									

Manteca Rotten Robbie
4: S. Airport Way & Wawona St

Existing Plus Project Condition-PM Peak Hour

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔		↑	↑		↔↔
Traffic Vol, veh/h	43	35	593	125	40	748
Future Vol, veh/h	43	35	593	125	40	748
Conflicting Peds, #/hr	0	0	0	6	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	45	37	624	132	42	787
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1495	624	0	-	624	0
Stage 1	624	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	136	487	-	0	962	-
Stage 1	536	-	-	0	-	-
Stage 2	411	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	125	487	-	-	962	-
Mov Cap-2 Maneuver	125	-	-	-	-	-
Stage 1	536	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	38.2	0	0.5			
HCM LOS	E					
Minor Lane/Major Mvmt	NBTWBLn1	SBL	SBT			
Capacity (veh/h)	- 188	962	-			
HCM Lane V/C Ratio	- 0.437	0.044	-			
HCM Control Delay (s)	- 38.2	8.9	0			
HCM Lane LOS	- E	A	A			
HCM 95th %tile Q(veh)	- 2	0.1	-			

Manteca Rotten Robbie
5: S. Airport Way & Yosemite Avenue

Existing Plus Project Condition-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	357	155	223	266	227	89	368	171	166	410	58
Future Volume (veh/h)	179	357	155	223	266	227	89	368	171	166	410	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	192	384	121	240	286	96	96	396	40	178	441	19
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	237	533	165	290	602	197	123	497	421	222	600	506
Arrive On Green	0.13	0.20	0.20	0.16	0.23	0.23	0.07	0.26	0.26	0.12	0.32	0.32
Sat Flow, veh/h	1795	2669	829	1795	2629	860	1795	1885	1598	1795	1885	1589
Grp Volume(v), veh/h	192	256	249	240	193	189	96	396	40	178	441	19
Grp Sat Flow(s),veh/h/ln	1795	1791	1707	1795	1791	1698	1795	1885	1598	1795	1885	1589
Q Serve(g_s), s	7.6	9.7	10.0	9.5	6.8	7.1	3.8	14.3	1.4	7.0	15.2	0.6
Cycle Q Clear(g_c), s	7.6	9.7	10.0	9.5	6.8	7.1	3.8	14.3	1.4	7.0	15.2	0.6
Prop In Lane	1.00		0.49	1.00		0.51	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	358	341	290	410	389	123	497	421	222	600	506
V/C Ratio(X)	0.81	0.72	0.73	0.83	0.47	0.49	0.78	0.80	0.10	0.80	0.73	0.04
Avail Cap(c_a), veh/h	374	618	589	497	750	711	138	919	779	383	1177	992
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	27.3	27.4	29.6	24.3	24.4	33.5	25.1	20.3	31.1	22.1	17.2
Incr Delay (d2), s/veh	7.2	2.7	3.0	6.0	0.8	0.9	22.2	3.0	0.1	6.6	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	4.0	4.0	4.2	2.7	2.7	2.3	6.2	0.5	3.3	6.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	30.0	30.4	35.7	25.1	25.4	55.7	28.1	20.4	37.7	23.9	17.2
LnGrp LOS	D	C	C	D	C	C	E	C	C	D	C	B
Approach Vol, veh/h		697			622			532			638	
Approach Delay, s/veh		32.3			29.3			32.5			27.6	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	23.6	16.6	19.4	9.4	27.7	14.4	21.5				
Change Period (Y+Rc), s	4.4	4.4	4.8	4.8	4.4	4.4	4.8	* 4.8				
Max Green Setting (Gmax), s	15.6	35.6	20.2	25.2	5.6	45.6	15.2	* 31				
Max Q Clear Time (g_c+I1), s	9.0	16.3	11.5	12.0	5.8	17.2	9.6	9.1				
Green Ext Time (p_c), s	0.2	2.2	0.4	2.3	0.0	2.7	0.2	2.0				
Intersection Summary												
HCM 6th Ctrl Delay			30.4									
HCM 6th LOS			C									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix C



Manteca Rotten Robbie

1: S. Airport Way & SR 120 EB Off ramp/SR 120 EB On ramp

Cumulative No Project-AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	380	5	210	0	0	0	0	1240	710	0	780	270
Future Volume (veh/h)	380	5	210	0	0	0	0	1240	710	0	780	270
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841				0	1841	1841	0	1841	1841
Adj Flow Rate, veh/h	404	0	168				0	1305	589	0	821	231
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4				0	4	4	0	4	4
Cap, veh/h	682	0	607				0	2080	908	0	2080	928
Arrive On Green	0.19	0.00	0.19				0.00	0.59	0.59	0.00	0.59	0.59
Sat Flow, veh/h	3506	0	3120				0	3589	1526	0	3589	1560
Grp Volume(v), veh/h	404	0	168				0	1305	589	0	821	231
Grp Sat Flow(s),veh/h/ln	1753	0	1560				0	1749	1526	0	1749	1560
Q Serve(g_s), s	4.9	0.0	2.2				0.0	11.3	12.0	0.0	5.8	3.3
Cycle Q Clear(g_c), s	4.9	0.0	2.2				0.0	11.3	12.0	0.0	5.8	3.3
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	682	0	607				0	2080	908	0	2080	928
V/C Ratio(X)	0.59	0.00	0.28				0.00	0.63	0.65	0.00	0.39	0.25
Avail Cap(c_a), veh/h	1440	0	1281				0	3408	1487	0	3408	1520
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	16.1				0.0	6.2	6.3	0.0	5.0	4.5
Incr Delay (d2), s/veh	1.0	0.0	0.3				0.0	0.3	0.7	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.6				0.0	2.1	2.0	0.0	1.1	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.3	0.0	16.4				0.0	6.4	7.0	0.0	5.2	4.7
LnGrp LOS	B	A	B				A	A	A	A	A	A
Approach Vol, veh/h	572						1894			1052		
Approach Delay, s/veh	17.7						6.6			5.0		
Approach LOS	B						A			A		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	33.3			13.7			33.3					
Change Period (Y+Rc), s	5.3			4.6			5.3					
Max Green Setting (Gmax), s	45.8			19.3			45.8					
Max Q Clear Time (g_c+I1), s	14.0			6.9			7.8					
Green Ext Time (p_c), s	14.0			2.2			6.6					
Intersection Summary												
HCM 6th Ctrl Delay	8.0											
HCM 6th LOS	A											
Notes												

Manteca Rotten Robbie

2: S. Airport Way & SR 120 WB On Ramp/SR 120 WB Off Ramp

Cumulative No Project-AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	380	5	800	0	1140	480	0	670	630
Future Volume (veh/h)	0	0	0	380	5	800	0	1140	480	0	670	630
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
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1841	1841	1841	0	1841	1841	0	1841	1841
Adj Flow Rate, veh/h				404	0	800	0	1200	400	0	705	505
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				4	4	4	0	4	4	0	4	4
Cap, veh/h				1231	0	1095	0	1674	747	0	1674	747
Arrive On Green				0.35	0.00	0.35	0.00	0.48	0.48	0.00	0.48	0.48
Sat Flow, veh/h				3506	0	3120	0	3589	1560	0	3589	1560
Grp Volume(v), veh/h				404	0	800	0	1200	400	0	705	505
Grp Sat Flow(s),veh/h/ln				1753	0	1560	0	1749	1560	0	1749	1560
Q Serve(g_s), s				4.9	0.0	13.0	0.0	15.8	10.4	0.0	7.6	14.5
Cycle Q Clear(g_c), s				4.9	0.0	13.0	0.0	15.8	10.4	0.0	7.6	14.5
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1231	0	1095	0	1674	747	0	1674	747
V/C Ratio(X)				0.33	0.00	0.73	0.00	0.72	0.54	0.00	0.42	0.68
Avail Cap(c_a), veh/h				1774	0	1579	0	2149	959	0	2197	980
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				13.8	0.0	16.5	0.0	12.0	10.6	0.0	9.9	11.7
Incr Delay (d2), s/veh				0.2	0.0	1.2	0.0	0.9	0.7	0.0	0.2	1.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.6	0.0	3.9	0.0	4.8	2.9	0.0	2.3	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				14.0	0.0	17.6	0.0	12.9	11.3	0.0	10.1	13.1
LnGrp LOS				B	A	B	A	B	B	A	B	B
Approach Vol, veh/h					1204			1600			1210	
Approach Delay, s/veh					16.4			12.5			11.3	
Approach LOS					B			B			B	
Timer - Assigned Phs	2			6			8					
Phs Duration (G+Y+Rc), s	33.1			33.1			25.0					
Change Period (Y+Rc), s	5.3			* 5.3			4.6					
Max Green Setting (Gmax), s	35.7			* 37			29.4					
Max Q Clear Time (g_c+I1), s	17.8			16.5			15.0					
Green Ext Time (p_c), s	10.0			7.9			5.4					

Intersection Summary

HCM 6th Ctrl Delay 13.3

HCM 6th LOS B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Manteca Rotten Robbie
3: S. Airport Way & Daniels St

Cumulative No Project-AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	40	310	410	80	80	610	960	370	80	580	70
Future Volume (veh/h)	130	40	310	410	80	80	610	960	370	80	580	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	137	42	272	432	84	63	642	1011	368	84	611	53
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	203	199	892	509	364	309	738	1876	1060	138	1809	655
Arrive On Green	0.06	0.11	0.11	0.15	0.20	0.20	0.22	0.54	0.54	0.04	0.36	0.36
Sat Flow, veh/h	3401	1841	2745	3401	1841	1560	3401	3497	1541	3401	5025	1560
Grp Volume(v), veh/h	137	42	272	432	84	63	642	1011	368	84	611	53
Grp Sat Flow(s),veh/h/ln	1700	1841	1373	1700	1841	1560	1700	1749	1541	1700	1675	1560
Q Serve(g_s), s	3.9	2.1	7.4	12.3	3.8	3.4	18.2	18.8	9.8	2.4	8.8	2.0
Cycle Q Clear(g_c), s	3.9	2.1	7.4	12.3	3.8	3.4	18.2	18.8	9.8	2.4	8.8	2.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	199	892	509	364	309	738	1876	1060	138	1809	655
V/C Ratio(X)	0.67	0.21	0.30	0.85	0.23	0.20	0.87	0.54	0.35	0.61	0.34	0.08
Avail Cap(c_a), veh/h	375	812	1806	614	941	798	921	1876	1060	273	1809	655
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(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.9	40.6	25.2	41.3	33.6	33.4	37.7	15.1	6.5	47.1	23.3	17.4
Incr Delay (d2), s/veh	3.9	0.5	0.2	9.3	0.3	0.3	7.6	1.1	0.9	4.3	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.0	2.4	5.8	1.7	1.3	8.0	7.0	3.1	1.1	3.4	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.8	41.1	25.4	50.6	33.9	33.8	45.3	16.2	7.4	51.4	23.8	17.6
LnGrp LOS	D	D	C	D	C	C	D	B	A	D	C	B
Approach Vol, veh/h		451			579			2021			748	
Approach Delay, s/veh		34.3			46.4			23.8			26.4	
Approach LOS		C			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	57.9	18.9	14.9	25.6	40.3	10.0	23.9				
Change Period (Y+Rc), s	4.0	4.4	4.0	4.1	4.0	4.4	4.0	4.1				
Max Green Setting (Gmax), s	8.0	53.5	18.0	44.0	27.0	34.5	11.0	51.0				
Max Q Clear Time (g_c+I1), s	4.4	20.8	14.3	9.4	20.2	10.8	5.9	5.8				
Green Ext Time (p_c), s	0.1	10.0	0.6	1.4	1.5	4.2	0.2	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			29.0									
HCM 6th LOS			C									

Manteca Rotten Robbie
4: S. Airport Way & Wawona St

Cumulative No Project-AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	200	40	990	180	30	530
Future Volume (veh/h)	200	40	990	180	30	530
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	211	31	1042	170	32	558
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	291	259	1529	249	52	2226
Arrive On Green	0.17	0.17	0.51	0.51	0.03	0.64
Sat Flow, veh/h	1753	1560	3103	490	1753	3589
Grp Volume(v), veh/h	211	31	604	608	32	558
Grp Sat Flow(s),veh/h/ln	1753	1560	1749	1752	1753	1749
Q Serve(g_s), s	4.6	0.7	10.5	10.6	0.7	2.8
Cycle Q Clear(g_c), s	4.6	0.7	10.5	10.6	0.7	2.8
Prop In Lane	1.00	1.00		0.28	1.00	
Lane Grp Cap(c), veh/h	291	259	888	890	52	2226
V/C Ratio(X)	0.72	0.12	0.68	0.68	0.61	0.25
Avail Cap(c_a), veh/h	865	770	1294	1297	346	3624
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	14.4	7.5	7.5	19.4	3.2
Incr Delay (d2), s/veh	3.4	0.2	0.9	0.9	11.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.2	2.7	2.7	0.4	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.4	14.6	8.4	8.4	30.4	3.2
LnGrp LOS	B	B	A	A	C	A
Approach Vol, veh/h	242		1212			590
Approach Delay, s/veh	18.8		8.4			4.7
Approach LOS	B		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.2	24.6			29.8	10.7
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	8.0	30.0			42.0	20.0
Max Q Clear Time (g_c+l1), s	2.7	12.6			4.8	6.6
Green Ext Time (p_c), s	0.0	8.0			3.9	0.6
Intersection Summary						
HCM 6th Ctrl Delay			8.6			
HCM 6th LOS			A			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	240	30	70	500	220	230	550	250	350	460	350
Future Volume (veh/h)	80	240	30	70	500	220	230	550	250	350	460	350
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	84	253	21	74	526	179	242	579	210	368	484	289
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	164	858	376	155	848	373	234	905	404	289	1014	452
Arrive On Green	0.05	0.25	0.25	0.05	0.24	0.24	0.13	0.26	0.26	0.16	0.29	0.29
Sat Flow, veh/h	3401	3497	1534	3401	3497	1536	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	84	253	21	74	526	179	242	579	210	368	484	289
Grp Sat Flow(s),veh/h/ln	1700	1749	1534	1700	1749	1536	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	1.6	3.8	0.7	1.4	8.6	6.4	8.6	9.5	7.4	10.6	7.3	10.4
Cycle Q Clear(g_c), s	1.6	3.8	0.7	1.4	8.6	6.4	8.6	9.5	7.4	10.6	7.3	10.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	164	858	376	155	848	373	234	905	404	289	1014	452
V/C Ratio(X)	0.51	0.30	0.06	0.48	0.62	0.48	1.03	0.64	0.52	1.27	0.48	0.64
Avail Cap(c_a), veh/h	380	2206	967	380	2227	978	234	2347	1047	289	2455	1095
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	19.8	18.6	30.0	21.7	20.9	27.9	21.2	20.4	26.9	18.8	19.9
Incr Delay (d2), s/veh	2.5	0.2	0.1	2.3	0.7	1.0	67.8	0.8	1.0	147.9	0.4	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.4	0.2	0.6	3.2	2.1	7.8	3.7	2.5	16.0	2.8	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	20.0	18.7	32.2	22.5	21.9	95.7	22.0	21.5	174.8	19.2	21.4
LnGrp LOS	C	B	B	C	C	C	F	C	C	F	B	C
Approach Vol, veh/h		358			779			1031			1141	
Approach Delay, s/veh		22.8			23.3			39.2			70.0	
Approach LOS		C			C			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	21.1	7.7	20.6	13.0	23.1	7.9	20.4				
Change Period (Y+Rc), s	4.4	4.4	4.8	4.8	4.4	4.4	4.8	* 4.8				
Max Green Setting (Gmax), s	10.6	43.2	7.2	40.6	8.6	45.2	7.2	* 41				
Max Q Clear Time (g_c+I1), s	12.6	11.5	3.4	5.8	10.6	12.4	3.6	10.6				
Green Ext Time (p_c), s	0.0	5.2	0.0	1.6	0.0	4.7	0.1	4.0				

Intersection Summary

HCM 6th Ctrl Delay 44.3

HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Manteca Rotten Robbie

1: S. Airport Way & SR 120 EB Off ramp/SR 120 EB On ramp

Cumulative No Project-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	600	0	600	0	0	0	0	960	520	0	1610	750
Future Volume (veh/h)	600	0	600	0	0	0	0	960	520	0	1610	750
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	0	1885	1885
Adj Flow Rate, veh/h	632	0	598				0	1011	389	0	1695	578
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1				0	1	1	0	1	1
Cap, veh/h	916	0	815				0	2154	940	0	2154	961
Arrive On Green	0.26	0.00	0.26				0.00	0.60	0.60	0.00	0.60	0.60
Sat Flow, veh/h	3591	0	3195				0	3676	1563	0	3676	1598
Grp Volume(v), veh/h	632	0	598				0	1011	389	0	1695	578
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1791	1563	0	1791	1598
Q Serve(g_s), s	11.0	0.0	11.8				0.0	10.8	9.1	0.0	24.7	15.6
Cycle Q Clear(g_c), s	11.0	0.0	11.8				0.0	10.8	9.1	0.0	24.7	15.6
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	916	0	815				0	2154	940	0	2154	961
V/C Ratio(X)	0.69	0.00	0.73				0.00	0.47	0.41	0.00	0.79	0.60
Avail Cap(c_a), veh/h	1114	0	991				0	2529	1104	0	2529	1128
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	0.0	23.5				0.0	7.6	7.3	0.0	10.4	8.6
Incr Delay (d2), s/veh	1.6	0.0	2.5				0.0	0.1	0.3	0.0	1.4	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	4.3	0.0	4.2				0.0	3.1	2.3	0.0	7.3	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	0.0	26.1				0.0	7.8	7.6	0.0	11.8	9.2
LnGrp LOS	C	A	C				A	A	A	A	B	A
Approach Vol, veh/h	1230						1400			2273		
Approach Delay, s/veh	25.4						7.7			11.2		
Approach LOS	C						A			B		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	46.8			22.2			46.8					
Change Period (Y+Rc), s	5.3			4.6			5.3					
Max Green Setting (Gmax), s	48.7			21.4			48.7					
Max Q Clear Time (g_c+I1), s	12.8			13.8			26.7					
Green Ext Time (p_c), s	9.4			3.8			14.8					
Intersection Summary												
HCM 6th Ctrl Delay	13.8											
HCM 6th LOS	B											
Notes												

Manteca Rotten Robbie

2: S. Airport Way & SR 120 WB On Ramp/SR 120 WB Off Ramp

Cumulative No Project-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	700	0	660	0	1240	320	0	1660	610
Future Volume (veh/h)	0	0	0	700	0	660	0	1240	320	0	1660	610
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
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1885	1885	1885	0	1885	1885	0	1885	1885
Adj Flow Rate, veh/h				737	0	618	0	1305	242	0	1747	463
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	1	1	0	1	1	0	1	1
Cap, veh/h				950	0	845	0	2158	962	0	2158	962
Arrive On Green				0.26	0.00	0.26	0.00	0.60	0.60	0.00	0.60	0.60
Sat Flow, veh/h				3591	0	3195	0	3676	1598	0	3676	1598
Grp Volume(v), veh/h				737	0	618	0	1305	242	0	1747	463
Grp Sat Flow(s),veh/h/ln				1795	0	1598	0	1791	1598	0	1791	1598
Q Serve(g_s), s				14.1	0.0	13.1	0.0	17.0	5.3	0.0	28.2	12.1
Cycle Q Clear(g_c), s				14.1	0.0	13.1	0.0	17.0	5.3	0.0	28.2	12.1
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				950	0	845	0	2158	962	0	2158	962
V/C Ratio(X)				0.78	0.00	0.73	0.00	0.60	0.25	0.00	0.81	0.48
Avail Cap(c_a), veh/h				1091	0	970	0	2286	1020	0	2325	1037
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				25.3	0.0	25.0	0.0	9.3	6.9	0.0	11.5	8.3
Incr Delay (d2), s/veh				3.3	0.0	2.6	0.0	0.4	0.1	0.0	2.2	0.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.8	0.0	4.8	0.0	5.1	1.4	0.0	9.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				28.6	0.0	27.6	0.0	9.7	7.1	0.0	13.7	8.7
LnGrp LOS				C	A	C	A	A	A	A	B	A
Approach Vol, veh/h					1355			1547			2210	
Approach Delay, s/veh					28.2			9.3			12.6	
Approach LOS					C			A			B	
Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		50.1				50.1		24.3				
Change Period (Y+Rc), s		5.3				* 5.3		4.6				
Max Green Setting (Gmax), s		47.5				* 48		22.6				
Max Q Clear Time (g_c+I1), s		19.0				30.2		16.1				
Green Ext Time (p_c), s		13.1				14.7		3.6				

Intersection Summary

HCM 6th Ctrl Delay	15.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Manteca Rotten Robbie
3: S. Airport Way & Daniels St

Cumulative No Project-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	370	180	1010	430	140	140	800	690	410	90	830	390
Future Volume (veh/h)	370	180	1010	430	140	140	800	690	410	90	830	390
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	389	189	1042	453	147	115	842	726	411	95	874	390
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	432	548	1514	443	554	470	862	1546	884	139	1153	556
Arrive On Green	0.12	0.29	0.29	0.13	0.29	0.29	0.25	0.43	0.43	0.04	0.22	0.22
Sat Flow, veh/h	3483	1885	2812	3483	1885	1598	3483	3582	1578	3483	5147	1598
Grp Volume(v), veh/h	389	189	1042	453	147	115	842	726	411	95	874	390
Grp Sat Flow(s),veh/h/ln	1742	1885	1406	1742	1885	1598	1742	1791	1578	1742	1716	1598
Q Serve(g_s), s	16.5	11.8	40.6	19.0	8.9	8.2	35.9	21.6	23.2	4.0	23.7	31.5
Cycle Q Clear(g_c), s	16.5	11.8	40.6	19.0	8.9	8.2	35.9	21.6	23.2	4.0	23.7	31.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	432	548	1514	443	554	470	862	1546	884	139	1153	556
V/C Ratio(X)	0.90	0.34	0.69	1.02	0.27	0.24	0.98	0.47	0.46	0.68	0.76	0.70
Avail Cap(c_a), veh/h	443	555	1524	443	555	470	862	1546	884	210	1153	556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.5	41.8	25.3	65.2	40.4	40.2	55.8	30.3	19.7	70.8	54.2	42.0
Incr Delay (d2), s/veh	20.7	0.4	1.3	48.8	0.3	0.3	24.9	1.0	1.8	5.8	4.7	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	5.6	13.7	11.5	4.3	3.3	18.5	9.4	9.0	1.9	10.6	13.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.3	42.1	26.6	114.1	40.7	40.4	80.8	31.3	21.4	76.6	58.9	49.2
LnGrp LOS	F	D	C	F	D	D	F	C	C	E	E	D
Approach Vol, veh/h		1620			715			1979			1359	
Approach Delay, s/veh		42.5			87.1			50.3			57.3	
Approach LOS		D			F			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	68.9	23.0	47.6	41.0	37.9	22.6	48.0				
Change Period (Y+Rc), s	4.0	4.4	4.0	4.1	4.0	4.4	4.0	4.1				
Max Green Setting (Gmax), s	9.0	61.5	19.0	44.0	37.0	33.5	19.0	44.0				
Max Q Clear Time (g_c+I1), s	6.0	25.2	21.0	42.6	37.9	33.5	18.5	10.9				
Green Ext Time (p_c), s	0.1	7.3	0.0	0.9	0.0	0.0	0.1	1.2				
Intersection Summary												
HCM 6th Ctrl Delay			54.4									
HCM 6th LOS			D									

Manteca Rotten Robbie
4: S. Airport Way & Wawona St

Cumulative No Project-PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	50	30	1070	130	50	1260
Future Volume (veh/h)	50	30	1070	130	50	1260
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	53	27	1126	128	53	1326
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	111	99	1781	202	83	2542
Arrive On Green	0.06	0.06	0.55	0.55	0.05	0.71
Sat Flow, veh/h	1795	1598	3336	368	1795	3676
Grp Volume(v), veh/h	53	27	621	633	53	1326
Grp Sat Flow(s),veh/h/ln	1795	1598	1791	1819	1795	1791
Q Serve(g_s), s	1.0	0.6	8.4	8.4	1.0	6.0
Cycle Q Clear(g_c), s	1.0	0.6	8.4	8.4	1.0	6.0
Prop In Lane	1.00	1.00		0.20	1.00	
Lane Grp Cap(c), veh/h	111	99	984	999	83	2542
V/C Ratio(X)	0.48	0.27	0.63	0.63	0.64	0.52
Avail Cap(c_a), veh/h	1026	913	1535	1559	410	4298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	15.7	5.4	5.4	16.4	2.3
Incr Delay (d2), s/veh	3.2	1.5	0.7	0.7	8.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.2	1.6	1.6	0.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.0	17.1	6.1	6.1	24.4	2.5
LnGrp LOS	B	B	A	A	C	A
Approach Vol, veh/h	80		1254			1379
Approach Delay, s/veh	18.4		6.1			3.4
Approach LOS	B		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.6	23.2			28.8	6.2
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	8.0	30.0			42.0	20.0
Max Q Clear Time (g_c+I1), s	3.0	10.4			8.0	3.0
Green Ext Time (p_c), s	0.0	8.8			11.9	0.2
Intersection Summary						
HCM 6th Ctrl Delay			5.1			
HCM 6th LOS			A			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	470	870	190	310	350	320	90	720	290	280	810	120
Future Volume (veh/h)	470	870	190	310	350	320	90	720	290	280	810	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	495	916	147	326	368	242	95	758	226	295	853	100
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	508	1079	474	387	955	419	120	949	423	299	1306	582
Arrive On Green	0.15	0.30	0.30	0.11	0.27	0.27	0.07	0.27	0.27	0.17	0.36	0.36
Sat Flow, veh/h	3483	3582	1573	3483	3582	1574	1795	3582	1598	1795	3582	1598
Grp Volume(v), veh/h	495	916	147	326	368	242	95	758	226	295	853	100
Grp Sat Flow(s),veh/h/ln	1742	1791	1573	1742	1791	1574	1795	1791	1598	1795	1791	1598
Q Serve(g_s), s	16.7	28.3	8.5	10.8	9.9	15.7	6.1	23.2	14.3	19.3	23.4	5.0
Cycle Q Clear(g_c), s	16.7	28.3	8.5	10.8	9.9	15.7	6.1	23.2	14.3	19.3	23.4	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	508	1079	474	387	955	419	120	949	423	299	1306	582
V/C Ratio(X)	0.97	0.85	0.31	0.84	0.39	0.58	0.79	0.80	0.53	0.99	0.65	0.17
Avail Cap(c_a), veh/h	508	1295	569	449	1246	548	222	1344	599	299	1496	667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.1	38.6	31.7	51.4	35.3	37.5	54.2	40.4	37.1	49.0	31.2	25.4
Incr Delay (d2), s/veh	33.1	4.7	0.4	12.1	0.3	1.3	11.0	2.3	1.0	48.6	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	12.6	3.2	5.2	4.2	6.0	3.1	10.5	5.5	12.6	10.2	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.2	43.4	32.1	63.5	35.6	38.7	65.2	42.7	38.1	97.6	32.1	25.5
LnGrp LOS	F	D	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1558			936			1079			1248	
Approach Delay, s/veh		55.0			46.1			43.7			47.0	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.0	35.6	17.9	40.3	12.3	47.4	22.0	36.2				
Change Period (Y+Rc), s	4.4	4.4	4.8	4.8	4.4	4.4	4.8	* 4.8				
Max Green Setting (Gmax), s	19.6	44.2	15.2	42.6	14.6	49.2	17.2	* 41				
Max Q Clear Time (g_c+I1), s	21.3	25.2	12.8	30.3	8.1	25.4	18.7	17.7				
Green Ext Time (p_c), s	0.0	6.0	0.3	5.0	0.1	6.8	0.0	3.0				

Intersection Summary

HCM 6th Ctrl Delay 48.7

HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix D



Manteca Rotten Robbie

1: S. Airport Way & SR 120 EB Off ramp/SR 120 EB On ramp

Cumulative Plus Project-AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	390	5	210	0	0	0	0	1245	710	0	784	280
Future Volume (veh/h)	390	5	210	0	0	0	0	1245	710	0	784	280
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841				0	1841	1841	0	1841	1841
Adj Flow Rate, veh/h	415	0	168				0	1311	589	0	825	232
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4				0	4	4	0	4	4
Cap, veh/h	692	0	616				0	2076	906	0	2076	926
Arrive On Green	0.20	0.00	0.20				0.00	0.59	0.59	0.00	0.59	0.59
Sat Flow, veh/h	3506	0	3120				0	3589	1526	0	3589	1560
Grp Volume(v), veh/h	415	0	168				0	1311	589	0	825	232
Grp Sat Flow(s),veh/h/ln	1753	0	1560				0	1749	1526	0	1749	1560
Q Serve(g_s), s	5.1	0.0	2.2				0.0	11.5	12.1	0.0	5.9	3.4
Cycle Q Clear(g_c), s	5.1	0.0	2.2				0.0	11.5	12.1	0.0	5.9	3.4
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	692	0	616				0	2076	906	0	2076	926
V/C Ratio(X)	0.60	0.00	0.27				0.00	0.63	0.65	0.00	0.40	0.25
Avail Cap(c_a), veh/h	1428	0	1270				0	3380	1475	0	3380	1507
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	16.1				0.0	6.3	6.4	0.0	5.1	4.6
Incr Delay (d2), s/veh	1.0	0.0	0.3				0.0	0.3	0.7	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.6				0.0	2.2	2.1	0.0	1.1	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.4	0.0	16.4				0.0	6.5	7.1	0.0	5.2	4.7
LnGrp LOS	B	A	B				A	A	A	A	A	A
Approach Vol, veh/h	583						1900			1057		
Approach Delay, s/veh	17.8						6.7			5.1		
Approach LOS	B						A			A		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	33.4			14.0			33.4					
Change Period (Y+Rc), s	5.3			4.6			5.3					
Max Green Setting (Gmax), s	45.8			19.3			45.8					
Max Q Clear Time (g_c+I1), s	14.1			7.1			7.9					
Green Ext Time (p_c), s	14.0			2.3			6.7					
Intersection Summary												
HCM 6th Ctrl Delay	8.1											
HCM 6th LOS	A											

Notes

User approved volume balancing among the lanes for turning movement.

Manteca Rotten Robbie

2: S. Airport Way & SR 120 WB On Ramp/SR 120 WB Off Ramp

Cumulative Plus Project-AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	380	5	816	0	1155	480	0	684	646
Future Volume (veh/h)	0	0	0	380	5	816	0	1155	480	0	684	646
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
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1841	1841	1841	0	1841	1841	0	1841	1841
Adj Flow Rate, veh/h				404	0	815	0	1216	400	0	720	517
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				4	4	4	0	4	4	0	4	4
Cap, veh/h				1239	0	1103	0	1675	747	0	1675	747
Arrive On Green				0.35	0.00	0.35	0.00	0.48	0.48	0.00	0.48	0.48
Sat Flow, veh/h				3506	0	3120	0	3589	1560	0	3589	1560
Grp Volume(v), veh/h				404	0	815	0	1216	400	0	720	517
Grp Sat Flow(s),veh/h/ln				1753	0	1560	0	1749	1560	0	1749	1560
Q Serve(g_s), s				5.0	0.0	13.5	0.0	16.4	10.6	0.0	8.0	15.3
Cycle Q Clear(g_c), s				5.0	0.0	13.5	0.0	16.4	10.6	0.0	8.0	15.3
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1239	0	1103	0	1675	747	0	1675	747
V/C Ratio(X)				0.33	0.00	0.74	0.00	0.73	0.54	0.00	0.43	0.69
Avail Cap(c_a), veh/h				1745	0	1553	0	2114	943	0	2161	964
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				14.0	0.0	16.7	0.0	12.3	10.8	0.0	10.1	12.0
Incr Delay (d2), s/veh				0.2	0.0	1.4	0.0	1.0	0.6	0.0	0.2	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
%ile BackOfQ(50%),veh/ln				1.6	0.0	4.1	0.0	5.1	2.9	0.0	2.4	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				14.1	0.0	18.1	0.0	13.3	11.4	0.0	10.3	13.7
LnGrp LOS				B	A	B	A	B	B	A	B	B
Approach Vol, veh/h				1219			1616			1237		
Approach Delay, s/veh				16.8			12.8			11.7		
Approach LOS				B			B			B		
Timer - Assigned Phs	2			6			8					
Phs Duration (G+Y+Rc), s	33.6			33.6			25.5					
Change Period (Y+Rc), s	5.3			* 5.3			4.6					
Max Green Setting (Gmax), s	35.7			* 37			29.4					
Max Q Clear Time (g_c+I1), s	18.4			17.3			15.5					
Green Ext Time (p_c), s	9.9			8.0			5.4					

Intersection Summary

HCM 6th Ctrl Delay 13.7

HCM 6th LOS B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Manteca Rotten Robbie
3: S. Airport Way & Daniels St

Cumulative Plus Project-AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	40	310	410	80	81	610	991	370	81	610	72
Future Volume (veh/h)	133	40	310	410	80	81	610	991	370	81	610	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	140	42	272	432	84	64	642	1043	368	85	642	55
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	207	199	892	509	363	307	738	1875	1059	139	1809	656
Arrive On Green	0.06	0.11	0.11	0.15	0.20	0.20	0.22	0.54	0.54	0.04	0.36	0.36
Sat Flow, veh/h	3401	1841	2745	3401	1841	1560	3401	3497	1541	3401	5025	1560
Grp Volume(v), veh/h	140	42	272	432	84	64	642	1043	368	85	642	55
Grp Sat Flow(s),veh/h/ln	1700	1841	1373	1700	1841	1560	1700	1749	1541	1700	1675	1560
Q Serve(g_s), s	4.0	2.1	7.4	12.3	3.8	3.4	18.2	19.7	9.8	2.5	9.4	2.1
Cycle Q Clear(g_c), s	4.0	2.1	7.4	12.3	3.8	3.4	18.2	19.7	9.8	2.5	9.4	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	207	199	892	509	363	307	738	1875	1059	139	1809	656
V/C Ratio(X)	0.68	0.21	0.30	0.85	0.23	0.21	0.87	0.56	0.35	0.61	0.35	0.08
Avail Cap(c_a), veh/h	375	811	1806	613	941	797	920	1875	1059	273	1809	656
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.9	40.6	25.2	41.3	33.7	33.6	37.7	15.3	6.5	47.1	23.4	17.4
Incr Delay (d2), s/veh	3.9	0.5	0.2	9.3	0.3	0.3	7.6	1.2	0.9	4.3	0.5	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	1.8	1.0	2.4	5.8	1.7	1.3	8.0	7.4	3.1	1.1	3.6	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.8	41.2	25.4	50.6	34.0	33.9	45.4	16.5	7.4	51.4	24.0	17.6
LnGrp LOS	D	D	C	D	C	C	D	B	A	D	C	B
Approach Vol, veh/h		454			580			2053			782	
Approach Delay, s/veh		34.4			46.4			23.9			26.5	
Approach LOS		C			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	57.9	18.9	14.9	25.6	40.3	10.1	23.8				
Change Period (Y+Rc), s	4.0	4.4	4.0	4.1	4.0	4.4	4.0	4.1				
Max Green Setting (Gmax), s	8.0	53.5	18.0	44.0	27.0	34.5	11.0	51.0				
Max Q Clear Time (g_c+I1), s	4.5	21.7	14.3	9.4	20.2	11.4	6.0	5.8				
Green Ext Time (p_c), s	0.1	10.3	0.6	1.4	1.5	4.4	0.2	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			29.0									
HCM 6th LOS			C									

Manteca Rotten Robbie
4: S. Airport Way & Wawona St

Cumulative Plus Project-AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	200	50	990	180	34	538
Future Volume (veh/h)	200	50	990	180	34	538
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	211	42	1042	170	36	566
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	294	262	1523	248	58	2226
Arrive On Green	0.17	0.17	0.51	0.51	0.03	0.64
Sat Flow, veh/h	1753	1560	3103	490	1753	3589
Grp Volume(v), veh/h	211	42	604	608	36	566
Grp Sat Flow(s),veh/h/ln	1753	1560	1749	1752	1753	1749
Q Serve(g_s), s	4.7	0.9	10.7	10.7	0.8	2.9
Cycle Q Clear(g_c), s	4.7	0.9	10.7	10.7	0.8	2.9
Prop In Lane	1.00	1.00		0.28	1.00	
Lane Grp Cap(c), veh/h	294	262	885	887	58	2226
V/C Ratio(X)	0.72	0.16	0.68	0.69	0.63	0.25
Avail Cap(c_a), veh/h	857	763	1283	1285	343	3592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	14.6	7.6	7.6	19.5	3.2
Incr Delay (d2), s/veh	3.3	0.3	0.9	0.9	10.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.3	2.8	2.8	0.5	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.4	14.8	8.6	8.6	30.1	3.3
LnGrp LOS	B	B	A	A	C	A
Approach Vol, veh/h	253		1212			602
Approach Delay, s/veh	18.6		8.6			4.9
Approach LOS	B		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.3	24.7			30.0	10.9
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	8.0	30.0			42.0	20.0
Max Q Clear Time (g_c+I1), s	2.8	12.7			4.9	6.7
Green Ext Time (p_c), s	0.0	8.0			3.9	0.6
Intersection Summary						
HCM 6th Ctrl Delay			8.7			
HCM 6th LOS			A			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	240	31	75	500	220	231	555	254	350	466	350
Future Volume (veh/h)	80	240	31	75	500	220	231	555	254	350	466	350
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	84	253	22	79	526	179	243	584	214	368	491	289
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	164	852	374	160	847	372	233	911	406	288	1020	455
Arrive On Green	0.05	0.24	0.24	0.05	0.24	0.24	0.13	0.26	0.26	0.16	0.29	0.29
Sat Flow, veh/h	3401	3497	1534	3401	3497	1536	1753	3497	1560	1753	3497	1560
Grp Volume(v), veh/h	84	253	22	79	526	179	243	584	214	368	491	289
Grp Sat Flow(s),veh/h/ln	1700	1749	1534	1700	1749	1536	1753	1749	1560	1753	1749	1560
Q Serve(g_s), s	1.6	3.8	0.7	1.5	8.7	6.5	8.6	9.6	7.6	10.6	7.5	10.4
Cycle Q Clear(g_c), s	1.6	3.8	0.7	1.5	8.7	6.5	8.6	9.6	7.6	10.6	7.5	10.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	164	852	374	160	847	372	233	911	406	288	1020	455
V/C Ratio(X)	0.51	0.30	0.06	0.50	0.62	0.48	1.04	0.64	0.53	1.28	0.48	0.64
Avail Cap(c_a), veh/h	379	2199	964	379	2220	975	233	2339	1043	288	2448	1092
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	19.9	18.7	30.0	21.8	21.0	28.0	21.2	20.5	27.0	18.9	19.9
Incr Delay (d2), s/veh	2.5	0.2	0.1	2.4	0.7	1.0	70.0	0.8	1.1	149.6	0.4	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.4	0.2	0.6	3.2	2.1	8.0	3.7	2.5	16.1	2.9	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.5	20.1	18.8	32.4	22.6	22.0	98.0	22.0	21.5	176.6	19.2	21.4
LnGrp LOS	C	C	B	C	C	C	F	C	C	F	B	C
Approach Vol, veh/h		359			784			1041			1148	
Approach Delay, s/veh		22.9			23.4			39.6			70.2	
Approach LOS		C			C			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	21.2	7.8	20.5	13.0	23.2	7.9	20.4				
Change Period (Y+Rc), s	4.4	4.4	4.8	4.8	4.4	4.4	4.8	* 4.8				
Max Green Setting (Gmax), s	10.6	43.2	7.2	40.6	8.6	45.2	7.2	* 41				
Max Q Clear Time (g_c+I1), s	12.6	11.6	3.5	5.8	10.6	12.4	3.6	10.7				
Green Ext Time (p_c), s	0.0	5.3	0.1	1.6	0.0	4.8	0.1	4.0				

Intersection Summary

HCM 6th Ctrl Delay 44.5

HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Manteca Rotten Robbie

1: S. Airport Way & SR 120 EB Off ramp/SR 120 EB On ramp

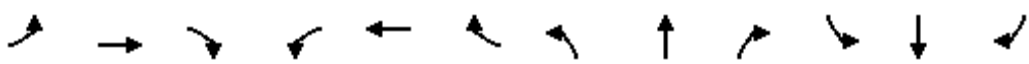
Cumulative Plus Project-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	622	0	600	0	0	0	0	965	520	0	1614	771
Future Volume (veh/h)	622	0	600	0	0	0	0	965	520	0	1614	771
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	0	1885	1885
Adj Flow Rate, veh/h	655	0	598				0	1016	389	0	1699	601
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1				0	1	1	0	1	1
Cap, veh/h	950	0	845				0	2215	967	0	2215	988
Arrive On Green	0.26	0.00	0.26				0.00	0.62	0.62	0.00	0.62	0.62
Sat Flow, veh/h	3591	0	3195				0	3676	1563	0	3676	1598
Grp Volume(v), veh/h	655	0	598				0	1016	389	0	1699	601
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1791	1563	0	1791	1598
Q Serve(g_s), s	11.2	0.0	11.6				0.0	10.3	8.6	0.0	23.5	15.7
Cycle Q Clear(g_c), s	11.2	0.0	11.6				0.0	10.3	8.6	0.0	23.5	15.7
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	950	0	845				0	2215	967	0	2215	988
V/C Ratio(X)	0.69	0.00	0.71				0.00	0.46	0.40	0.00	0.77	0.61
Avail Cap(c_a), veh/h	1155	0	1028				0	2619	1143	0	2619	1168
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	22.6	0.0	22.8				0.0	6.9	6.6	0.0	9.5	8.0
Incr Delay (d2), s/veh	1.5	0.0	2.0				0.0	0.1	0.2	0.0	1.2	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	4.4	0.0	4.1				0.0	2.8	2.1	0.0	6.7	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	0.0	24.7				0.0	7.1	6.9	0.0	10.6	8.6
LnGrp LOS	C	A	C				A	A	A	A	B	A
Approach Vol, veh/h	1253						1405			2300		
Approach Delay, s/veh	24.4						7.0			10.1		
Approach LOS	C						A			B		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	46.3			22.1			46.3					
Change Period (Y+Rc), s	5.3			4.6			5.3					
Max Green Setting (Gmax), s	48.7			21.4			48.7					
Max Q Clear Time (g_c+I1), s	12.3			13.6			25.5					
Green Ext Time (p_c), s	9.5			3.9			15.5					
Intersection Summary												
HCM 6th Ctrl Delay	12.8											
HCM 6th LOS	B											
Notes												

Manteca Rotten Robbie

2: S. Airport Way & SR 120 WB On Ramp/SR 120 WB Off Ramp

Cumulative Plus Project-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	700	0	683	0	1267	320	0	1685	631
Future Volume (veh/h)	0	0	0	700	0	683	0	1267	320	0	1685	631
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
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	0	1885	1885	0	1885	1885
Adj Flow Rate, veh/h				737	0	642	0	1334	242	0	1774	483
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	1	1	0	1	1	0	1	1
Cap, veh/h				975	0	868	0	2226	993	0	2187	976
Arrive On Green				0.27	0.00	0.27	0.00	0.62	0.62	0.00	0.61	0.61
Sat Flow, veh/h				3591	0	3195	0	3676	1598	0	3676	1598
Grp Volume(v), veh/h				737	0	642	0	1334	242	0	1774	483
Grp Sat Flow(s),veh/h/ln				1795	0	1598	0	1791	1598	0	1791	1598
Q Serve(g_s), s				14.1	0.0	13.7	0.0	16.8	5.1	0.0	28.6	12.6
Cycle Q Clear(g_c), s				14.1	0.0	13.7	0.0	16.8	5.1	0.0	28.6	12.6
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				975	0	868	0	2226	993	0	2187	976
V/C Ratio(X)				0.76	0.00	0.74	0.00	0.60	0.24	0.00	0.81	0.50
Avail Cap(c_a), veh/h				1115	0	992	0	2339	1043	0	2339	1043
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				24.9	0.0	24.8	0.0	8.5	6.3	0.0	11.2	8.1
Incr Delay (d2), s/veh				2.8	0.0	2.8	0.0	0.4	0.1	0.0	2.2	0.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.7	0.0	5.0	0.0	4.9	1.3	0.0	9.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				27.7	0.0	27.6	0.0	8.9	6.5	0.0	13.4	8.6
LnGrp LOS				C	A	C	A	A	A	A	B	A
Approach Vol, veh/h					1379			1576			2257	
Approach Delay, s/veh					27.7			8.6			12.4	
Approach LOS					C			A			B	
Timer - Assigned Phs	2			6			8					
Phs Duration (G+Y+Rc), s	50.4			50.4			24.3					
Change Period (Y+Rc), s	5.3			* 5.3			4.6					
Max Green Setting (Gmax), s	47.5			* 48			22.6					
Max Q Clear Time (g_c+I1), s	18.8			30.6			16.1					
Green Ext Time (p_c), s	13.5			14.6			3.6					

Intersection Summary

HCM 6th Ctrl Delay 15.3

HCM 6th LOS B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Manteca Rotten Robbie
3: S. Airport Way & Daniels St

Cumulative Plus Project-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	372	180	1010	430	140	141	800	740	410	91	876	392
Future Volume (veh/h)	372	180	1010	430	140	141	800	740	410	91	876	392
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	392	189	1042	453	147	116	842	779	411	96	922	392
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	435	550	1514	443	554	469	862	1555	884	140	1167	557
Arrive On Green	0.12	0.29	0.29	0.13	0.29	0.29	0.25	0.43	0.43	0.04	0.23	0.22
Sat Flow, veh/h	3483	1885	2812	3483	1885	1598	3483	3582	1578	3483	5147	1598
Grp Volume(v), veh/h	392	189	1042	453	147	116	842	779	411	96	922	392
Grp Sat Flow(s),veh/h/ln	1742	1885	1406	1742	1885	1598	1742	1791	1578	1742	1716	1598
Q Serve(g_s), s	16.6	11.8	40.6	19.0	8.9	8.3	35.9	23.5	23.2	4.1	25.2	31.6
Cycle Q Clear(g_c), s	16.6	11.8	40.6	19.0	8.9	8.3	35.9	23.5	23.2	4.1	25.2	31.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	435	550	1514	443	554	469	862	1555	884	140	1167	557
V/C Ratio(X)	0.90	0.34	0.69	1.02	0.27	0.25	0.98	0.50	0.47	0.69	0.79	0.70
Avail Cap(c_a), veh/h	443	556	1524	443	556	471	862	1555	884	210	1167	557
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.5	41.7	25.3	65.2	40.4	40.2	55.8	30.6	19.7	70.8	54.4	42.0
Incr Delay (d2), s/veh	21.1	0.4	1.3	48.8	0.3	0.3	24.9	1.2	1.8	5.8	5.5	7.3
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	8.7	5.6	13.7	11.5	4.3	3.3	18.5	10.3	9.0	1.9	11.4	13.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.6	42.1	26.6	114.1	40.7	40.5	80.8	31.7	21.5	76.6	59.9	49.2
LnGrp LOS	F	D	C	F	D	D	F	C	C	E	E	D
Approach Vol, veh/h		1623			716			2032			1410	
Approach Delay, s/veh		42.7			87.1			50.0			58.1	
Approach LOS		D			F			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	68.9	23.0	47.6	41.0	37.9	22.7	47.9				
Change Period (Y+Rc), s	4.0	4.4	4.0	4.1	4.0	4.4	4.0	4.1				
Max Green Setting (Gmax), s	9.0	61.5	19.0	44.0	37.0	33.5	19.0	44.0				
Max Q Clear Time (g_c+I1), s	6.1	25.5	21.0	42.6	37.9	33.6	18.6	10.9				
Green Ext Time (p_c), s	0.1	7.8	0.0	0.9	0.0	0.0	0.1	1.2				
Intersection Summary												
HCM 6th Ctrl Delay			54.5									
HCM 6th LOS			D									

Manteca Rotten Robbie
4: S. Airport Way & Wawona St

Cumulative Plus Project-PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 		 	 
Traffic Volume (veh/h)	50	38	1070	130	53	1267
Future Volume (veh/h)	50	38	1070	130	53	1267
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1885	1885
Adj Flow Rate, veh/h	53	34	1126	128	56	1334
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	68	43	1773	201	86	2536
Arrive On Green	0.07	0.07	0.55	0.55	0.05	0.71
Sat Flow, veh/h	1032	662	3336	368	1795	3676
Grp Volume(v), veh/h	88	0	621	633	56	1334
Grp Sat Flow(s),veh/h/ln	1714	0	1791	1819	1795	1791
Q Serve(g_s), s	1.8	0.0	8.5	8.5	1.1	6.1
Cycle Q Clear(g_c), s	1.8	0.0	8.5	8.5	1.1	6.1
Prop In Lane	0.60	0.39		0.20	1.00	
Lane Grp Cap(c), veh/h	112	0	980	995	86	2536
V/C Ratio(X)	0.78	0.00	0.63	0.64	0.65	0.53
Avail Cap(c_a), veh/h	970	0	1521	1545	407	4258
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.3	0.0	5.6	5.6	16.5	2.4
Incr Delay (d2), s/veh	11.3	0.0	0.7	0.7	8.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.7	1.7	0.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.5	0.0	6.2	6.2	24.6	2.6
LnGrp LOS	C	A	A	A	C	A
Approach Vol, veh/h	88		1254			1390
Approach Delay, s/veh	27.5		6.2			3.5
Approach LOS	C		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.7	23.3			29.0	6.3
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	8.0	30.0			42.0	20.0
Max Q Clear Time (g_c+l1), s	3.1	10.5			8.1	3.8
Green Ext Time (p_c), s	0.0	8.8			12.0	0.2
Intersection Summary						
HCM 6th Ctrl Delay			5.5			
HCM 6th LOS			A			
Notes						
User approved volume balancing among the lanes for turning movement.						

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	470	870	191	314	350	320	91	724	293	280	815	120
Future Volume (veh/h)	470	870	191	314	350	320	91	724	293	280	815	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	495	916	148	331	368	242	96	762	229	295	858	100
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	532	1099	483	413	965	424	127	964	430	305	1319	588
Arrive On Green	0.15	0.31	0.31	0.12	0.27	0.27	0.07	0.27	0.27	0.17	0.37	0.37
Sat Flow, veh/h	3483	3582	1573	3483	3582	1574	1795	3582	1598	1795	3582	1598
Grp Volume(v), veh/h	495	916	148	331	368	242	96	762	229	295	858	100
Grp Sat Flow(s),veh/h/ln	1742	1791	1573	1742	1791	1574	1795	1791	1598	1795	1791	1598
Q Serve(g_s), s	16.5	28.1	8.5	10.9	9.9	15.6	6.2	23.3	14.4	19.2	23.5	5.0
Cycle Q Clear(g_c), s	16.5	28.1	8.5	10.9	9.9	15.6	6.2	23.3	14.4	19.2	23.5	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	532	1099	483	413	965	424	127	964	430	305	1319	588
V/C Ratio(X)	0.93	0.83	0.31	0.80	0.38	0.57	0.76	0.79	0.53	0.97	0.65	0.17
Avail Cap(c_a), veh/h	532	1319	579	473	1258	553	229	1356	605	305	1508	672
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.3	38.0	31.3	50.6	35.1	37.2	53.8	40.0	36.7	48.6	30.9	25.1
Incr Delay (d2), s/veh	23.1	4.1	0.4	8.5	0.2	1.2	8.8	2.2	1.0	42.8	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	12.4	3.2	5.1	4.2	6.0	3.1	10.5	5.6	12.2	10.2	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.4	42.1	31.6	59.1	35.3	38.4	62.6	42.1	37.8	91.4	31.8	25.2
LnGrp LOS	E	D	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1559			941			1087			1253	
Approach Delay, s/veh		50.7			44.5			43.0			45.3	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.0	35.7	18.0	40.2	12.3	47.4	22.0	36.1				
Change Period (Y+Rc), s	4.4	4.4	4.8	4.8	4.4	4.4	4.8	* 4.8				
Max Green Setting (Gmax), s	19.6	44.2	15.2	42.6	14.6	49.2	17.2	* 41				
Max Q Clear Time (g_c+I1), s	21.2	25.3	12.9	30.1	8.2	25.5	18.5	17.6				
Green Ext Time (p_c), s	0.0	6.0	0.3	5.1	0.1	6.9	0.0	3.0				

Intersection Summary

HCM 6th Ctrl Delay 46.4

HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Manteca Rotten Robbie

1: S. Airport Way & SR 120 EB Off ramp/SR 120 EB On ramp

Cumulative Plus Project-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	622	0	600	0	0	0	0	965	520	0	1614	771
Future Volume (veh/h)	622	0	600	0	0	0	0	965	520	0	1614	771
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885				0	1885	1885	0	1885	1885
Adj Flow Rate, veh/h	655	0	598				0	1016	389	0	1699	601
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1				0	1	1	0	1	1
Cap, veh/h	916	0	815				0	2156	941	0	2156	962
Arrive On Green	0.26	0.00	0.26				0.00	0.60	0.60	0.00	0.60	0.60
Sat Flow, veh/h	3591	0	3195				0	3676	1563	0	3676	1598
Grp Volume(v), veh/h	655	0	598				0	1016	389	0	1699	601
Grp Sat Flow(s),veh/h/ln	1795	0	1598				0	1791	1563	0	1791	1598
Q Serve(g_s), s	11.5	0.0	11.9				0.0	10.9	9.1	0.0	24.9	16.6
Cycle Q Clear(g_c), s	11.5	0.0	11.9				0.0	10.9	9.1	0.0	24.9	16.6
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	916	0	815				0	2156	941	0	2156	962
V/C Ratio(X)	0.71	0.00	0.73				0.00	0.47	0.41	0.00	0.79	0.62
Avail Cap(c_a), veh/h	1109	0	987				0	2517	1099	0	2517	1123
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	0.0	23.6				0.0	7.7	7.3	0.0	10.4	8.8
Incr Delay (d2), s/veh	1.9	0.0	2.5				0.0	0.1	0.3	0.0	1.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	4.3				0.0	3.1	2.3	0.0	7.4	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	0.0	26.2				0.0	7.8	7.6	0.0	11.9	9.6
LnGrp LOS	C	A	C				A	A	A	A	B	A
Approach Vol, veh/h	1253						1405			2300		
Approach Delay, s/veh	25.8						7.7			11.3		
Approach LOS	C						A			B		
Timer - Assigned Phs	2			4			6					
Phs Duration (G+Y+Rc), s	47.0			22.3			47.0					
Change Period (Y+Rc), s	5.3			4.6			5.3					
Max Green Setting (Gmax), s	48.7			21.4			48.7					
Max Q Clear Time (g_c+I1), s	12.9			13.9			26.9					
Green Ext Time (p_c), s	9.4			3.8			14.8					
Intersection Summary												
HCM 6th Ctrl Delay	14.0											
HCM 6th LOS	B											
Notes												

Manteca Rotten Robbie

2: S. Airport Way & SR 120 WB On Ramp/SR 120 WB Off Ramp

Cumulative Plus Project-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	700	0	683	0	1267	320	0	1685	631
Future Volume (veh/h)	0	0	0	700	0	683	0	1267	320	0	1685	631
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
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1885	1885	1885	0	1885	1885	0	1885	1885
Adj Flow Rate, veh/h				737	0	642	0	1334	242	0	1774	483
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	1	1	0	1	1	0	1	1
Cap, veh/h				948	0	844	0	2163	965	0	2163	965
Arrive On Green				0.26	0.00	0.26	0.00	0.60	0.60	0.00	0.60	0.60
Sat Flow, veh/h				3591	0	3195	0	3676	1598	0	3676	1598
Grp Volume(v), veh/h				737	0	642	0	1334	242	0	1774	483
Grp Sat Flow(s),veh/h/ln				1795	0	1598	0	1791	1598	0	1791	1598
Q Serve(g_s), s				14.3	0.0	13.9	0.0	17.6	5.3	0.0	29.2	12.9
Cycle Q Clear(g_c), s				14.3	0.0	13.9	0.0	17.6	5.3	0.0	29.2	12.9
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				948	0	844	0	2163	965	0	2163	965
V/C Ratio(X)				0.78	0.00	0.76	0.00	0.62	0.25	0.00	0.82	0.50
Avail Cap(c_a), veh/h				1082	0	962	0	2267	1011	0	2306	1028
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				25.6	0.0	25.4	0.0	9.4	6.9	0.0	11.7	8.4
Incr Delay (d2), s/veh				3.4	0.0	3.3	0.0	0.5	0.1	0.0	2.4	0.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.9	0.0	5.1	0.0	5.4	1.4	0.0	9.4	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.0	0.0	28.8	0.0	9.9	7.1	0.0	14.1	8.9
LnGrp LOS				C	A	C	A	A	A	A	B	A
Approach Vol, veh/h					1379			1576			2257	
Approach Delay, s/veh					28.9			9.4			13.0	
Approach LOS					C			A			B	
Timer - Assigned Phs	2			6			8					
Phs Duration (G+Y+Rc), s	50.6			50.6			24.4					
Change Period (Y+Rc), s	5.3			* 5.3			4.6					
Max Green Setting (Gmax), s	47.5			* 48			22.6					
Max Q Clear Time (g_c+I1), s	19.6			31.2			16.3					
Green Ext Time (p_c), s	13.3			14.2			3.6					

Intersection Summary

HCM 6th Ctrl Delay 16.1

HCM 6th LOS B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Manteca Rotten Robbie
3: S. Airport Way & Daniels St

Cumulative Plus Project-PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	372	180	1010	430	140	141	800	740	410	91	876	392
Future Volume (veh/h)	372	180	1010	430	140	141	800	740	410	91	876	392
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	392	189	1042	453	147	116	842	779	411	96	922	392
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	435	548	1514	443	553	468	862	1545	884	140	1153	557
Arrive On Green	0.12	0.29	0.29	0.13	0.29	0.29	0.25	0.43	0.43	0.04	0.22	0.22
Sat Flow, veh/h	3483	1885	2812	3483	1885	1598	3483	3582	1578	3483	5147	1598
Grp Volume(v), veh/h	392	189	1042	453	147	116	842	779	411	96	922	392
Grp Sat Flow(s),veh/h/ln	1742	1885	1406	1742	1885	1598	1742	1791	1578	1742	1716	1598
Q Serve(g_s), s	16.6	11.8	40.6	19.0	8.9	8.3	35.9	23.6	23.2	4.1	25.3	31.6
Cycle Q Clear(g_c), s	16.6	11.8	40.6	19.0	8.9	8.3	35.9	23.6	23.2	4.1	25.3	31.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	435	548	1514	443	553	468	862	1545	884	140	1153	557
V/C Ratio(X)	0.90	0.34	0.69	1.02	0.27	0.25	0.98	0.50	0.47	0.69	0.80	0.70
Avail Cap(c_a), veh/h	443	555	1524	443	555	470	862	1545	884	210	1153	557
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.5	41.8	25.3	65.2	40.5	40.3	55.8	30.9	19.7	70.8	54.8	42.0
Incr Delay (d2), s/veh	21.1	0.4	1.3	48.8	0.3	0.3	24.9	1.2	1.8	5.8	5.8	7.3
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	8.7	5.6	13.7	11.5	4.3	3.3	18.5	10.3	9.0	1.9	11.4	13.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.6	42.1	26.6	114.1	40.8	40.5	80.8	32.1	21.5	76.6	60.7	49.2
LnGrp LOS	F	D	C	F	D	D	F	C	C	E	E	D
Approach Vol, veh/h		1623			716			2032			1410	
Approach Delay, s/veh		42.7			87.1			50.1			58.6	
Approach LOS		D			F			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	68.9	23.0	47.6	41.0	37.9	22.7	47.9				
Change Period (Y+Rc), s	4.0	4.4	4.0	4.1	4.0	4.4	4.0	4.1				
Max Green Setting (Gmax), s	9.0	61.5	19.0	44.0	37.0	33.5	19.0	44.0				
Max Q Clear Time (g_c+I1), s	6.1	25.6	21.0	42.6	37.9	33.6	18.6	10.9				
Green Ext Time (p_c), s	0.1	7.8	0.0	0.9	0.0	0.0	0.1	1.2				
Intersection Summary												
HCM 6th Ctrl Delay			54.7									
HCM 6th LOS			D									

Manteca Rotten Robbie
4: S. Airport Way & Wawona St

Cumulative Plus Project-PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WT		TT		LT	TT
Traffic Volume (veh/h)	50	38	1070	130	53	1267
Future Volume (veh/h)	50	38	1070	130	53	1267
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1885	1885
Adj Flow Rate, veh/h	53	35	1126	128	56	1334
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	67	44	1773	201	86	2535
Arrive On Green	0.07	0.07	0.55	0.55	0.05	0.71
Sat Flow, veh/h	1020	674	3336	368	1795	3676
Grp Volume(v), veh/h	89	0	621	633	56	1334
Grp Sat Flow(s),veh/h/ln	1713	0	1791	1819	1795	1791
Q Serve(g_s), s	1.8	0.0	8.5	8.5	1.1	6.1
Cycle Q Clear(g_c), s	1.8	0.0	8.5	8.5	1.1	6.1
Prop In Lane	0.60	0.39		0.20	1.00	
Lane Grp Cap(c), veh/h	113	0	979	995	86	2535
V/C Ratio(X)	0.79	0.00	0.63	0.64	0.65	0.53
Avail Cap(c_a), veh/h	969	0	1520	1543	406	4255
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.3	0.0	5.6	5.6	16.5	2.4
Incr Delay (d2), s/veh	11.4	0.0	0.7	0.7	8.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.7	1.7	0.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.7	0.0	6.2	6.2	24.6	2.6
LnGrp LOS	C	A	A	A	C	A
Approach Vol, veh/h	89		1254			1390
Approach Delay, s/veh	27.7		6.2			3.5
Approach LOS	C		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.7	23.3			29.0	6.3
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	8.0	30.0			42.0	20.0
Max Q Clear Time (g_c+I1), s	3.1	10.5			8.1	3.8
Green Ext Time (p_c), s	0.0	8.8			12.0	0.2
Intersection Summary						
HCM 6th Ctrl Delay			5.5			
HCM 6th LOS			A			
Notes						
User approved volume balancing among the lanes for turning movement.						

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	470	870	191	314	350	320	91	724	293	280	815	120
Future Volume (veh/h)	470	870	191	314	350	320	91	724	293	280	815	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	495	916	148	331	368	242	96	762	229	295	858	100
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	506	1078	473	391	960	422	121	952	425	297	1304	582
Arrive On Green	0.15	0.30	0.30	0.11	0.27	0.27	0.07	0.27	0.27	0.17	0.36	0.36
Sat Flow, veh/h	3483	3582	1573	3483	3582	1574	1795	3582	1598	1795	3582	1598
Grp Volume(v), veh/h	495	916	148	331	368	242	96	762	229	295	858	100
Grp Sat Flow(s),veh/h/ln	1742	1791	1573	1742	1791	1574	1795	1791	1598	1795	1791	1598
Q Serve(g_s), s	16.8	28.4	8.6	11.0	9.9	15.7	6.2	23.5	14.5	19.4	23.7	5.0
Cycle Q Clear(g_c), s	16.8	28.4	8.6	11.0	9.9	15.7	6.2	23.5	14.5	19.4	23.7	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	506	1078	473	391	960	422	121	952	425	297	1304	582
V/C Ratio(X)	0.98	0.85	0.31	0.85	0.38	0.57	0.79	0.80	0.54	0.99	0.66	0.17
Avail Cap(c_a), veh/h	506	1289	566	447	1240	545	221	1337	596	297	1488	664
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.4	38.9	31.9	51.6	35.4	37.5	54.4	40.5	37.2	49.3	31.5	25.5
Incr Delay (d2), s/veh	34.3	4.8	0.4	12.7	0.3	1.2	11.0	2.4	1.1	50.1	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	12.7	3.2	5.4	4.2	6.0	3.2	10.6	5.6	12.8	10.3	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.8	43.7	32.3	64.2	35.6	38.7	65.4	42.9	38.3	99.4	32.4	25.7
LnGrp LOS	F	D	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1559			941			1087			1253	
Approach Delay, s/veh		55.7			46.5			43.9			47.6	
Approach LOS		E			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.0	35.9	18.1	40.4	12.4	47.5	22.0	36.5				
Change Period (Y+Rc), s	4.4	4.4	4.8	4.8	4.4	4.4	4.8	* 4.8				
Max Green Setting (Gmax), s	19.6	44.2	15.2	42.6	14.6	49.2	17.2	* 41				
Max Q Clear Time (g_c+I1), s	21.4	25.5	13.0	30.4	8.2	25.7	18.8	17.7				
Green Ext Time (p_c), s	0.0	6.0	0.3	5.0	0.1	6.9	0.0	3.0				

Intersection Summary

HCM 6th Ctrl Delay 49.2

HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.