



*Draft Transportation Impact Analysis
For*

Oleander-Sundance Residential

June 2006

*Prepared for:
EDAW*

*Prepared by:
Fehr & Peers*

Draft Report

**Oleander-Sundance
Transportation Impact Analysis**

Prepared for:

EDAW, Inc.

Prepared by:

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EXECUTIVE SUMMARY

This report presents the results of the traffic impact analysis (TIA) for the proposed Oleander Estates and Sundance residential project. The proposed project is approximately 230 acres and includes construction of 1,074 single-family homes, 57,500 square feet of retail commercial space, and a 20,000-square-foot Boys and Girls Club in the City of Manteca, California. The purpose of the analysis is to identify potential transportation impacts of the proposed development on the surrounding roadway system, and recommend appropriate improvements to mitigate these significant impacts.

PROJECT CONDITIONS

The proposed project is estimated to generate 11,912 daily trips, 867 AM peak-hour trips (259 inbound and 608 outbound), and 1,162 PM peak-hour trips (693 inbound and 469 outbound).

The impact criteria used to analyze the project's impacts is described below:

Signalized Intersections

For this analysis, traffic impacts at signalized intersections are defined to occur when the addition of project traffic causes:

- 1) intersection operations to deteriorate from an acceptable level (LOS D or better) under Existing Conditions to an unacceptable level (LOS E or F); or
- 2) exacerbation of unacceptable operations at study intersections by increasing the volume-to-capacity (V/C) ratio by 0.01 or more at an intersection operating at LOS E or F under Existing Conditions.

Based on the project impact criteria listed above, the proposed project will ***not cause a significant impact*** at any of the signalized study intersections.

Unsignalized Intersections

A significant impact at an unsignalized intersection is defined to occur when:

- 1) the addition of project traffic causes intersection operations to deteriorate from an acceptable level (LOS D or better) under Existing Conditions to an unacceptable level (LOS E or F) under Project Conditions and the turning movement volumes exceed the peak-hour traffic signal warrant criteria from the 2003 *Manual on Uniform Traffic Control Devices*.
- 2) the addition of project traffic exacerbates unacceptable operations (LOS E or F) under Existing Conditions and the turning movement volumes exceed the peak-hour traffic signal warrant criteria from the 2003 *Manual on Uniform Traffic Control Devices*.
- 3) at freeway intersections the off-ramp queue length increases by 5 or more vehicles.

With the addition of project-generated traffic, the proposed project is expected to significantly impact the following transportation system facilities:

Intersections

- o Airport Way and State Route 120 Westbound Ramps (both AM and PM peak hours)
- o Airport Way and State Route 120 Eastbound Ramps (both AM and PM peak hours)
- o Union Road and State Route 120 Westbound Ramps (both AM and PM peak hours)
- o Union Road and State Route 120 Eastbound Ramps (both AM and PM peak hours)

Freeway

- o Westbound SR 120 mainline segment, Airport Way to Yosemite Avenue (AM peak hour)
- o Eastbound SR 120 mainline segment, Yosemite Avenue to Airport Way (PM peak hour)

The following improvements were identified to mitigate the project's impacts or improve the operations of the transportation system:

- The recommended mitigation measures were signalization of the four study intersections and widen the off-ramp approach to the intersections
- The freeway impacts are considered significant and unavoidable and no feasible mitigation was identified

Pedestrian, Bicycle, and Transit

Since the proposed project would create demand for public transit and bicycle facilities above that which is provided, the proposed project would have a **significant impact on the transit and bicycle facilities**.

The proposed project should coordinate with the City of Manteca and the San Joaquin Regional Transit District (SJRTD) to determine the appropriate transit facilities necessary to serve the proposed development at such time that expected ridership levels would warrant the service and funding is available. With the implementation of the necessary transit facilities, the project's impact would be mitigated.

The proposed project should also coordinate with the City of Manteca to determine the specific bicycle facilities improvements required to mitigate the bicycle impacts. Providing dedicated bike lanes, bike routes, or other bicycle improvements would mitigate the project's impact.

2010 CUMULATIVE CONDITIONS

The proposed project also was analyzed under 2010 Cumulative Conditions. Traffic projections using the San Joaquin Council of Governments (SJCOG) were used to estimate 2010 Cumulative Conditions. The Cumulative Conditions analysis resulted in the following impacts using the same criteria described for Project Conditions except the levels of service were compared between Cumulative No Project and Cumulative With Project:

Intersections

- o Airport Way and Eastbound State Route 120
- o Woodward Avenue and Union Road
- o Woodward Avenue and Oleander Road

Roadway Segments

- o Airport Way south of State Route 120

Freeway

- o Eastbound State Route 120 mainline segment, Yosemite Avenue to Airport Way (PM peak hour)
- o Westbound State Route 120 mainline segment, Main Street to Yosemite Avenue (three segments during the AM peak hour)
- o Westbound State Route 120 Merge and Diverge ramps at Union Road (AM peak hour)
- o Westbound State Route 120 Merge and Diverge ramps at Airport Way (AM peak hour)

The following improvements were identified to mitigate the project's cumulative impacts or improve the operations of the transportation system:

- Providing a shared left-turn/through lane and a separate right-turn lane on the eastbound approach of the Airport Way/Eastbound State Route 120 intersection
- Providing a separate left-turn lane and a shared right-turn/through lane on the southbound approach of the intersection of Union Road and Woodward Avenue
- Widen Airport Way south of State Route 120 from 2 to 4 lanes
- The freeway impacts are considered significant and unavoidable and no feasible mitigation was identified
- The Woodward Avenue/Oleander Road intersection is recommended to be modified to provide an all-way stop control

1. INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Oleander Estates and Sundance residential project. The proposed project is approximately 230 acres and includes construction of 1,074 single-family homes, 57,500 square feet of retail commercial space, and a 20,000-square-foot Boys and Girls Club in the City of Manteca, California. The project site is generally bounded by State Route 120 to the north, Peach Avenue to the south, Union Road to the east, and Airport Way to the west.

The purpose of the analysis is to identify potential transportation impacts of the proposed development on the surrounding roadway system, and recommend appropriate improvements to mitigate these significant impacts. A map of the project site location is presented on Figure 1. Figure 2 shows the proposed site plan.

Existing and future conditions were evaluated with level of service calculations for the key intersections and roadway segments near the project site. Project impacts were estimated following the guidelines of the City of Manteca.

The analysis evaluated the operations of the following key intersections and roadway segments:

Study Intersections

1. Airport Way and West Yosemite Avenue
2. Airport Way and Wawona Street
3. Airport Way and Daniels Street
4. Airport Way and State Route 120 Westbound Ramps
5. Airport Way and State Route 120 Eastbound Ramps
6. Airport Way and Atherton Drive
7. Airport Way and Woodward Avenue
8. Airport Way and Peach Avenue
9. Woodward Avenue and Oleander Road
10. Peach Avenue and Oleander Road
11. Union Road and West Yosemite Avenue
12. Union Road and Wawona Street
13. Union Road and Daniels Street
14. Union Road and State Route 120 Westbound Ramps
15. Union Road and State Route 120 Eastbound Ramps
16. Union Road and Atherton Drive (Future Intersection)
17. Union Road and Woodward Avenue
18. Union Road and Peach Avenue
19. Woodward Avenue and Moffat Boulevard
20. Moffat Boulevard and State Route 99 Southbound Ramp

21. Moffat Boulevard and Austin Road
22. State Route 99 Northbound Ramps and Austin Road

Study Roadway Segments

1. Airport Way, North of State Route 120
2. Airport Way, South of State Route 120
3. Union Road, North of State Route 120
4. Union Road, South of State Route 120
5. Woodward Avenue, East of Union Road

In addition, existing and future conditions were evaluated with level of service calculations for the freeway mainline segments and ramp junctions near the project site. Project impacts to freeway facilities were estimated following the guidelines of the California Department of Transportation (Caltrans).

The operations of the study intersections were evaluated during the weekday morning (AM) and evening (PM) peak periods. The operations of the roadway and freeway segments were evaluated using the average daily traffic volumes obtained from counts. Each intersection and roadway segment was evaluated for the following four scenarios:

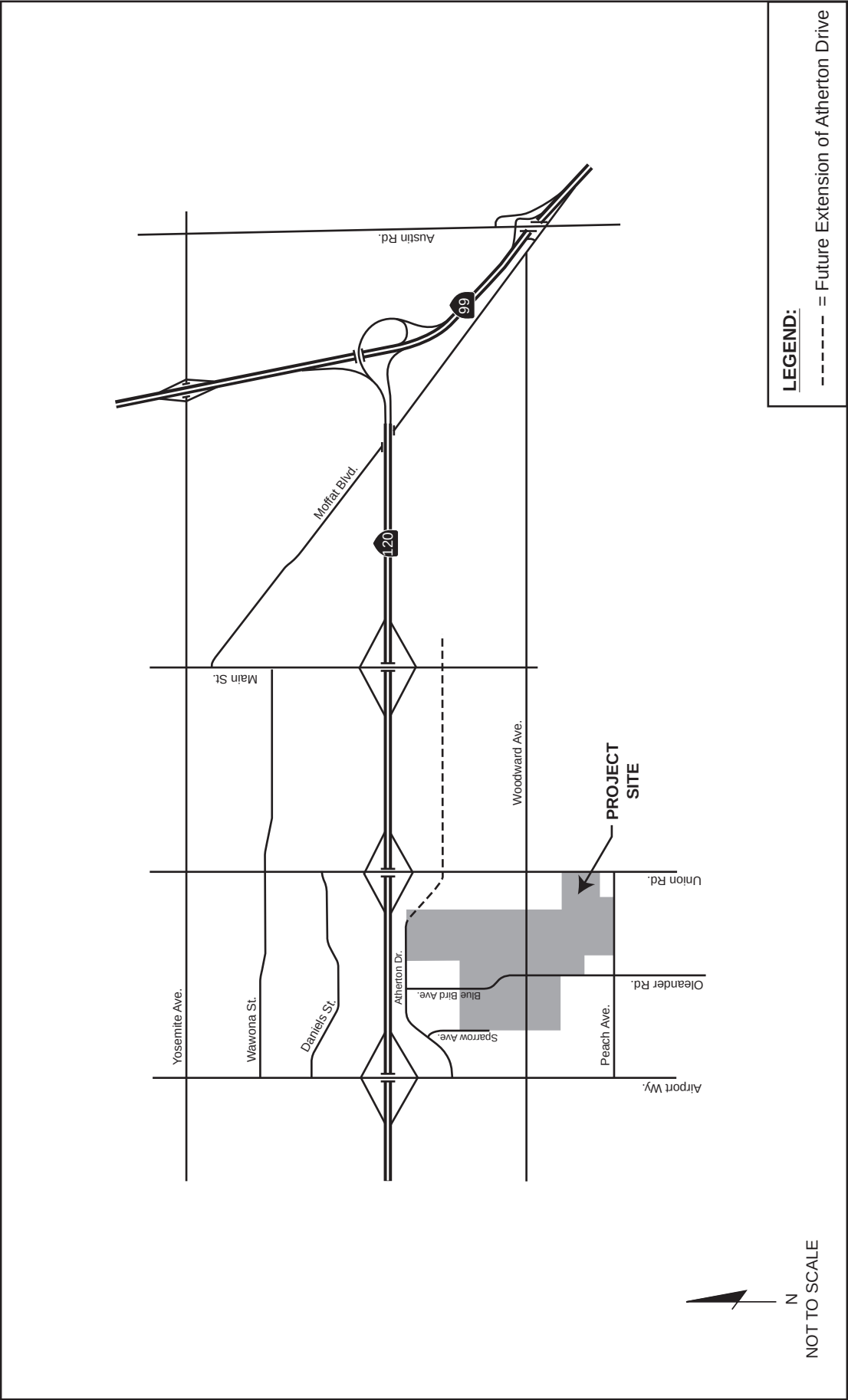
Scenario 1: *Existing Conditions* – Existing volumes obtained from counts.

Scenario 2: *Project Conditions* – Existing volumes plus new traffic generated by the proposed project.

Scenario 3: *Cumulative (2010) No Project Conditions* – Volumes obtained from the City of Manteca General Plan Transportation Analysis (GPTA) model for the future horizon year.

Scenario 4: *Cumulative (2010) With Project Conditions* – Project-generated traffic added to Scenario 3 traffic volumes.

The remainder of this report is divided into three chapters. The existing transportation system serving the site and the current operating conditions of the key intersections and roadway segments are described in Chapter 2. Chapter 3 describes the method used to estimate the amount of traffic added to the surrounding roadways by the proposed project and its impacts on the transportation system under Project Conditions. This chapter also includes a discussion of site access and on-site circulation. Cumulative Conditions with and without the project are described in Chapter 4.



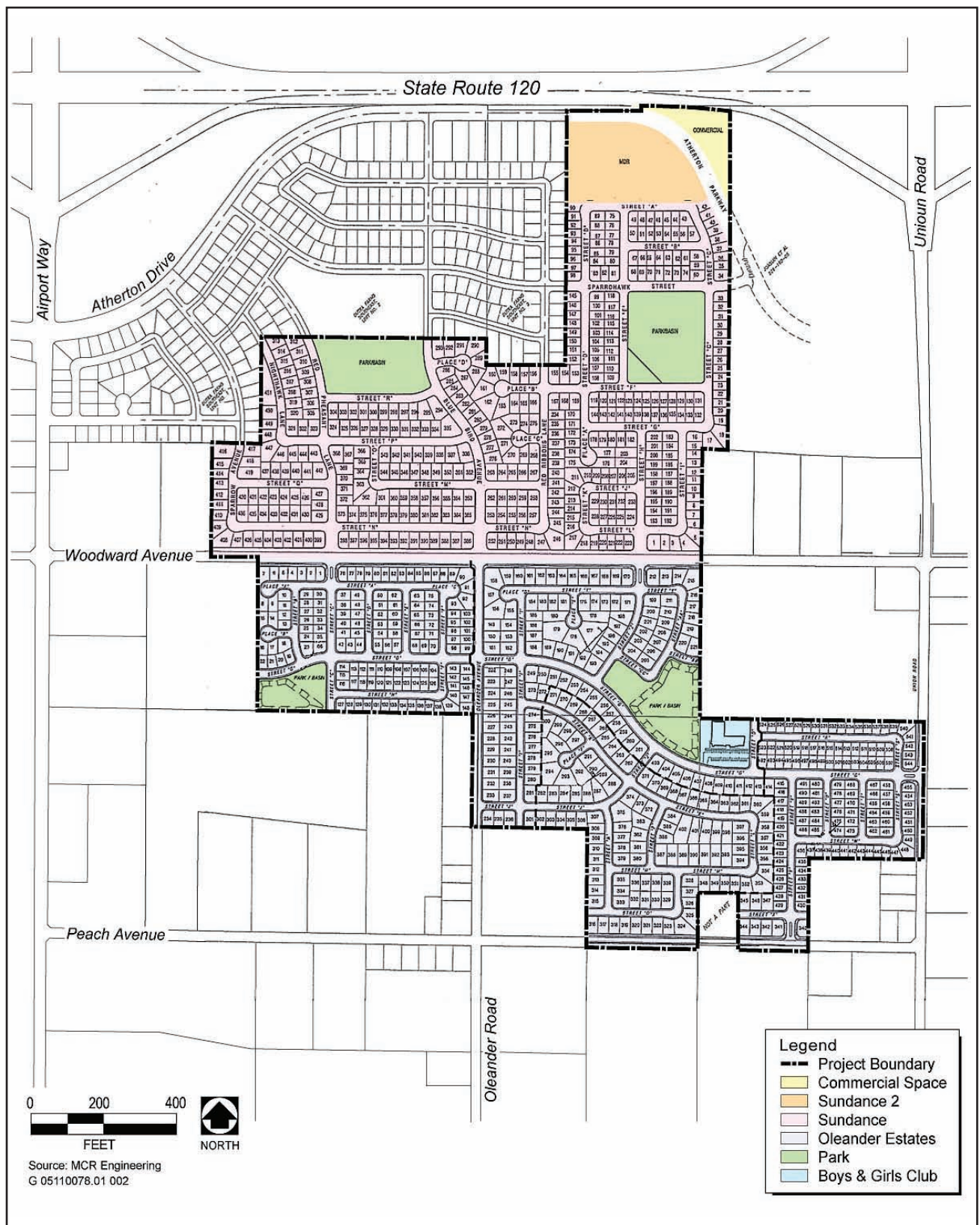
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Oleander Estates and Sundance Residential

PROJECT SITE LOCATION

FIGURE 1



2. EXISTING CONDITIONS

This chapter describes the existing conditions of the roadway facilities, pedestrian and bicycle facilities, transit service, traffic volumes, and intersection operations. This chapter also includes a discussion of the methodology used to calculate intersection levels of service and the corresponding results.

ROADWAY NETWORK

The project site location and the surrounding roadway network are presented on Figure 1. Regional access is provided by State Route 120 (SR 120). Local access is provided by Woodward Avenue, Airport Way, and Union Road. Descriptions of these roadways are provided below.

SR 120 is an east-west, four-lane freeway that primarily serves as a connection between Interstate 5 and State Route 99. State Route 120 provides interchanges at Airport Way, Union Road, and Main Street within the City of Manteca.



Intersection of Union Road and Yosemite Avenue.

Airport Way is a north-south, two-lane roadway located west of the project site. The posted speed limit is 40 mph. It extends from Stockton in the north to Rainbow Lake in the south.

Union Road is a north-south, two- to four-lane roadway that borders the eastern edge of the project site. It is a four-lane roadway north of Wawona Street. The posted speed limit is 35 mph north of Wawona Street and 40 mph between Wawona Street and Woodward Avenue. South of Woodward Avenue the speed limit increases to 55 mph. Union Road extends from French Camp Road in the north to Avenue D in the south.

Woodward Avenue is an east-west, two-lane roadway that passes through the project site. It extends from Oakwood Lake in the west to Moffat Boulevard in the east. The roadway is primarily rural in nature and provides access to farmland and nearby homes.

Peach Avenue is an east-west, two-lane roadway that borders the southern edge of the project site. It extends from Airport Way in the west to Union Road in the east, parallel to and south of Woodward Avenue. The posted speed limit is 35 mph. The roadway is primarily rural in nature and provides access to farmland and nearby homes.

Oleander Road is a north-south, two-lane roadway that runs through the project site. It extends from Woodward Avenue in the north to Ripon Road in the south. The posted speed limit is 35 mph. The roadway is primarily rural in nature and provides access to farmland and nearby homes.

Yosemite Avenue is an east-west, four-lane roadway that primarily serves Manteca. It extends from SR 120 in the west to SR 99 in the east, where it becomes SR 120, a two-lane highway. This roadway is a primary commercial corridor for people in the area.

Wawona Street is an east-west, two-lane roadway within Manteca. It extends from Airport Way in the west to Main Street in the east. It is parallel to Yosemite Avenue and located between Yosemite Avenue and Daniels Street. This roadway provides access to residential areas.

Daniels Street is an east-west, local street within Manteca. It extends from Airport Way in the west to Union Road in the east. Daniels Street is also parallel to Wawona Street and located between Wawona Street and SR 120. This roadway provides access to residential areas.

PEDESTRIAN AND BICYCLE FACILITIES

Pedestrian facilities comprise sidewalks, crosswalks, and pedestrian signals at signalized intersections. Sidewalks are not provided on Woodward Avenue, Peach Avenue, Oleander Road, or Union Road. Sidewalks are provided on Airport Way in the vicinity of Atherton Drive, as well as on Atherton Drive. Streets in the subdivisions north of SR 120 have sidewalks. There are no signalized intersections or pedestrian crossings in the project area.

Bicycle facilities comprise bike paths, bike lanes, and bike routes. Bike paths (Class I facilities) are paved pathways for use by bicycles that are separated from roadways. Bike lanes (Class II facilities) are lanes on roadways designated for use by bicycles with special lane markings, pavement legends, and signage. Bike routes (Class III facilities) are designated with signs only. There is a bike path paralleling Atherton Drive. A bicycle lane exists on Airport Way south of Atherton Drive. Additional bike lanes and bike routes are located north of SR 120. The existing bicycle facilities are shown in Figure 3.

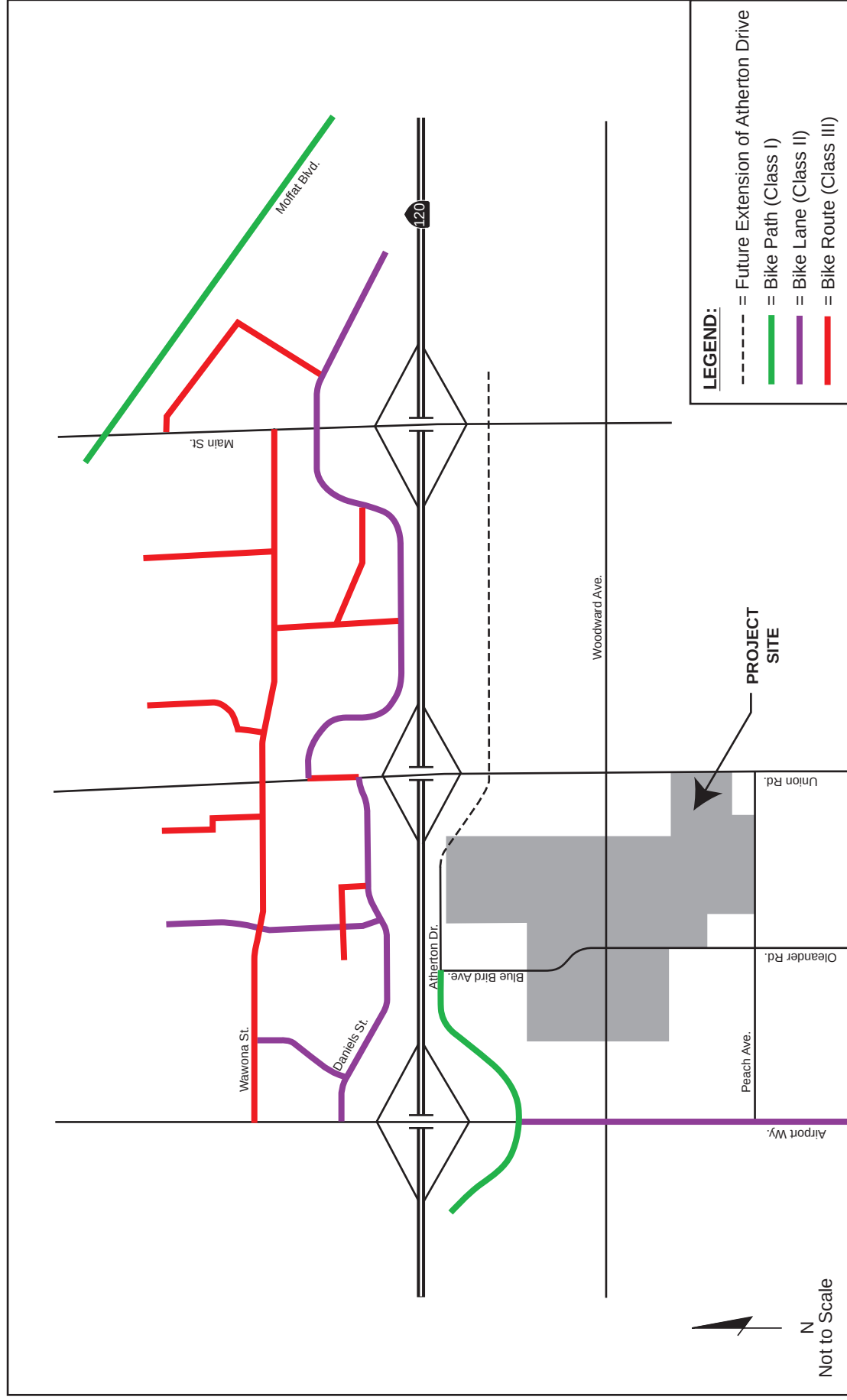
TRANSIT SERVICE

The San Joaquin Regional Transit District (RTD) operates fixed-route and flexible-response bus service in San Joaquin County. The Modesto Area Express (MAX) operates fixed-route bus service between Modesto and the Lathrop-Manteca ACE Rail Station. The City of Manteca currently does not operate bus service. Figure 4 shows the existing transit facilities near the project site. Each route is described below.

RTD Route 26 provides intercity fixed-route service between Tracy, Lathrop, Stockton, and Manteca, with limited service to Ripon. Service operates Monday-Friday from 6:00 AM to 10:30 PM with 75-minute headways. This is the only bus service near the project site, with scheduled service operating through the Union Road interchange.

RTD Route 91 provides intercity flexible-response service between Stockton, Manteca, and Lathrop. Weekday service operates from 6:00 AM to 6:00 PM with 60- to 180-minute headways. Weekend service operates from 9:00 AM to 4:45 PM with three northbound and four southbound trips. Scheduled service operates along Union Road and Wawona Street.

MAX ACE Express provides commuter service between Modesto and the Lathrop-Manteca ACE Rail Station. Service operates Monday-Friday with three northbound AM and three southbound PM trips. While this route does pass through the Airport Way and SR-120 interchange, there are no posted bus stops in the area.



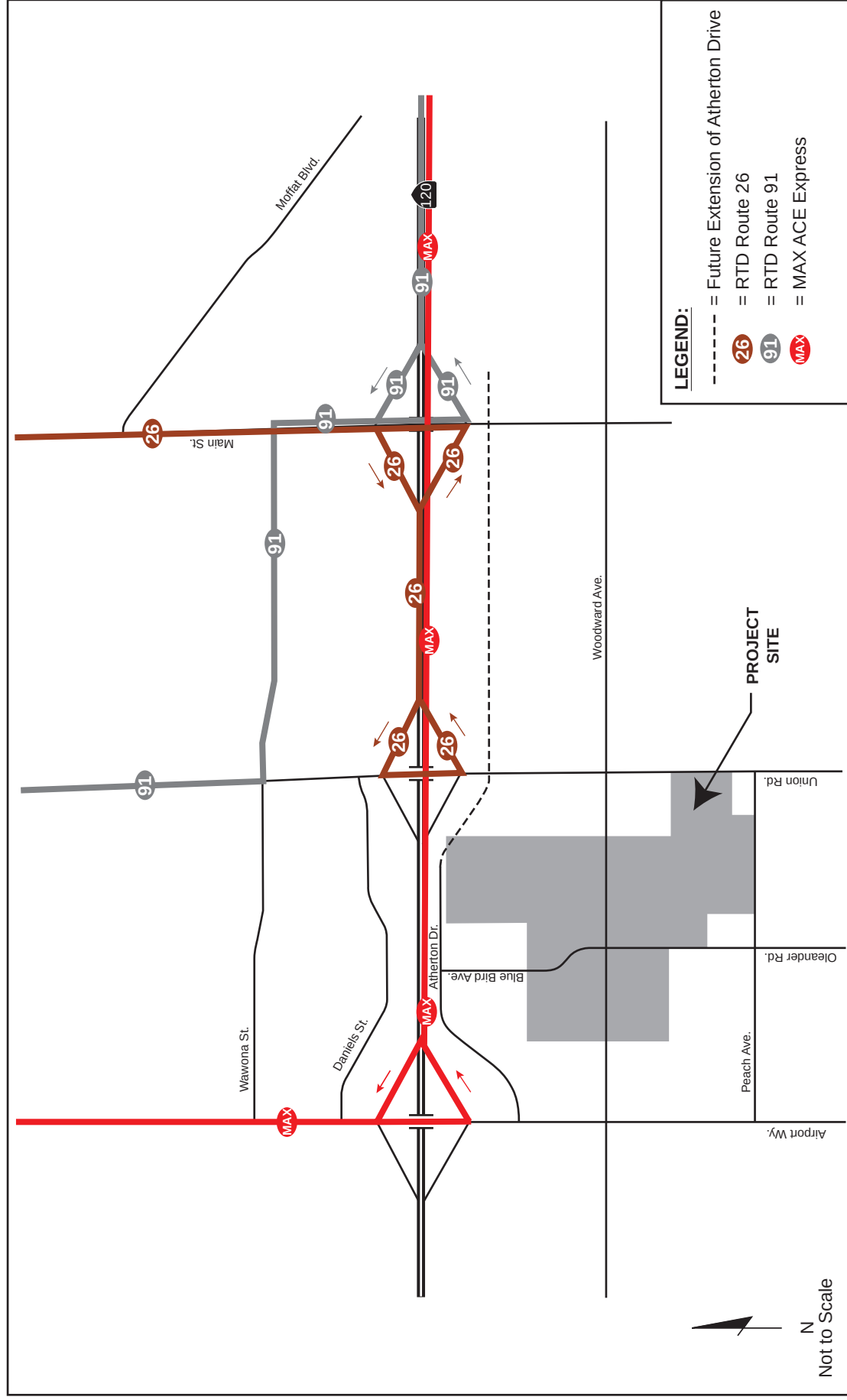
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EXISTING BICYCLE FACILITIES

FIGURE 3



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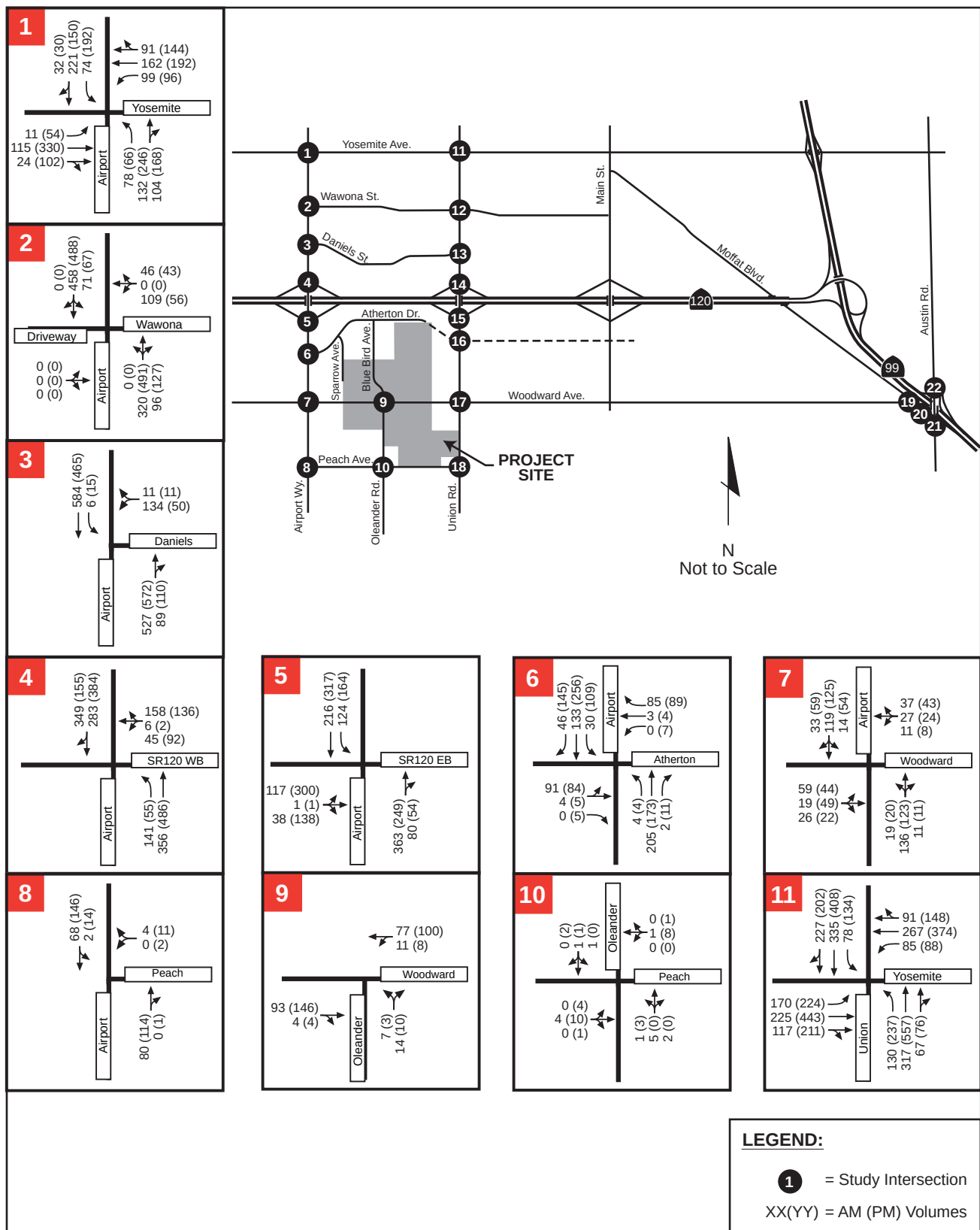
EXISTING TRANSIT SERVICE

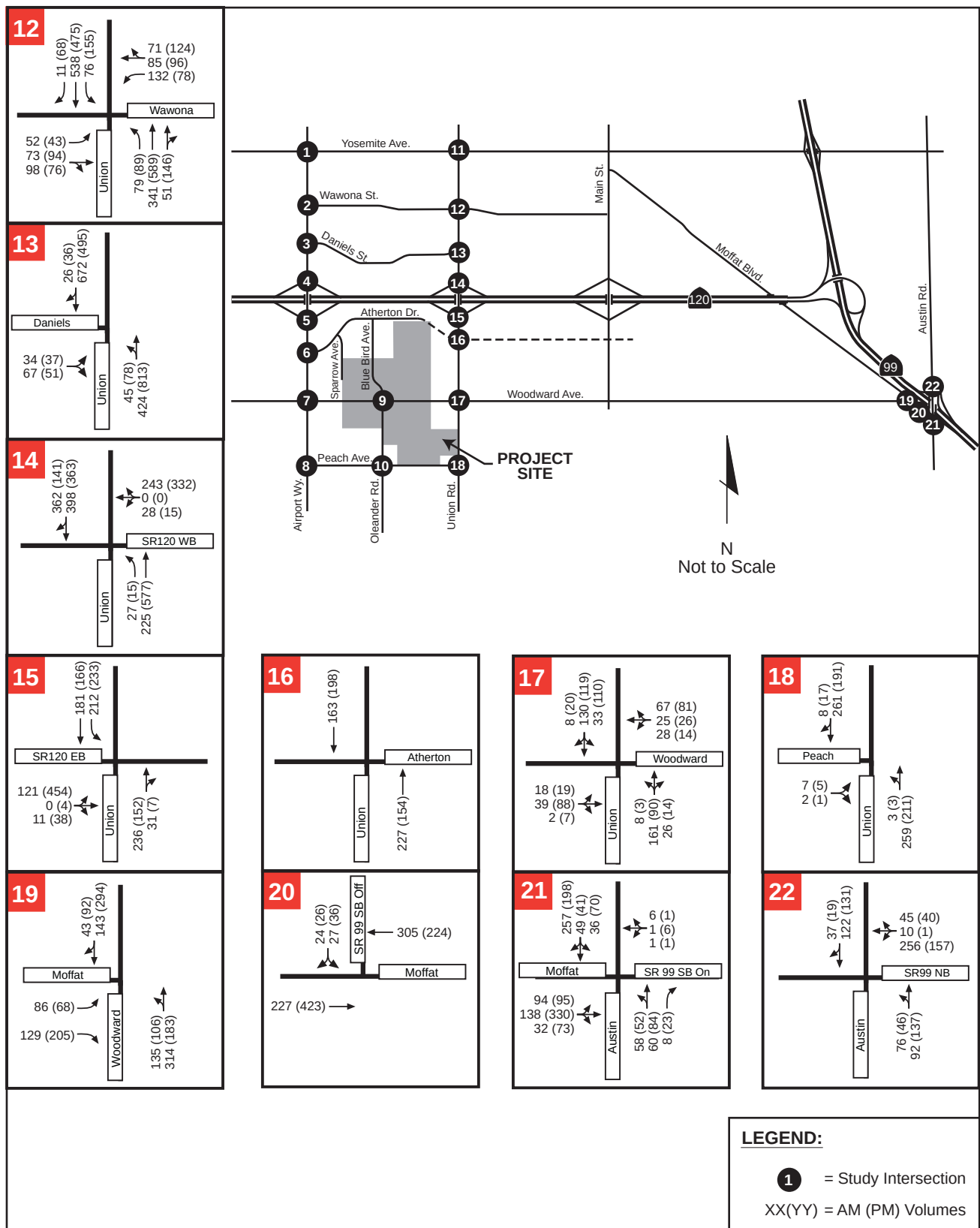
FIGURE 4

INTERSECTION VOLUMES AND LANE CONFIGURATIONS

The operations of the key intersections were evaluated during weekday morning (AM) and evening (PM) peak-hour conditions. The AM and PM peak periods occur from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively. Intersection operations were evaluated for the highest one-hour volume counted during each period.

Traffic counts were conducted at the study intersections during the AM and PM peak periods in May, June, September, and October 2005 (obtained from the Lifestyle Transportation Impact Analysis performed by TJKM) and January 2006 (see Appendix A). Figure 5 presents the existing AM and PM peak-hour turning movement volumes at the study intersections, as well as existing intersection lane configurations and traffic control devices.





LEVEL OF SERVICE METHODOLOGY

The operations of roadway facilities are described with the term level of service (LOS). LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined, from LOS A with the best operating conditions to LOS F with the worst operating conditions. LOS E represents “at-capacity” operations. Operations are designated as LOS F when volumes exceed capacity, resulting in stop-and-go conditions.

Signalized Intersections

The level of service methodology approved by the City of Manteca analyzes a signalized intersection's operation based on average control vehicular delay, as calculated using the method described in Chapter 16 of the *2000 Highway Capacity Manual (HCM)* (Special Report 209, Transportation Research Board). Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections was calculated using the TRAFFIX analysis software and is correlated to a LOS designation as shown in Table 1.

TABLE 1 SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS USING AVERAGE CONTROL VEHICULAR DELAY		
Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	55.1 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0
Source: <i>Highway Capacity Manual</i> , Transportation Research Board, 2000.		

Intersection Level of Service Criteria

The level of service standard (i.e., minimum acceptable operations) for intersections in the City of Manteca is LOS C on a city-wide basis, with a minimum acceptable LOS D at individual intersections dependent upon site restraints. The Caltrans standard for ramp intersections is at the LOS C/D cusp. The San Joaquin County

Traffic Impact Study standard is LOS D for roadways in their jurisdiction with a minor arterial classification or higher (e.g., major arterial, freeway) and LOS C for all other roadways.

Unsignalized Intersections

Operations of the unsignalized study intersections (e.g., stop-sign controlled) were evaluated using the methodology contained in Chapter 17 of the 2000 HCM. LOS ratings for stop-sign controlled intersections are based on the average control delay expressed in seconds per vehicle. At two-way or side street-controlled intersections, the control delay is calculated for each movement, not for the intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. For all-way stop-controlled locations, a weighted average delay for the entire intersection is presented. Table 2 summarizes the relationship between delay and LOS for unsignalized intersections.

TABLE 2 UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS USING AVERAGE CONTROL DELAY		
Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay.	≤ 10.0
B	Short traffic delays.	10.1 to 15.0
C	Average traffic delays.	15.1 to 25.0
D	Long traffic delays.	25.1 to 35.0
E	Very long traffic delays.	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded.	> 50.0
Source: <i>Highway Capacity Manual</i> , Transportation Research Board, 2000.		

Roadway Segments

Roadway segment operations were evaluated using the measurements outlined in the *EIR for Manteca General Plan 2023*, which are based on research conducted by the Florida Department of Transportation. The relationship between daily traffic volumes and LOS ratings are presented in Table 3.

TABLE 3 DAILY TRAFFIC VOLUME LEVELS OF SERVICE			
Lanes	Level of Service C	Level of Service D	Level of Service E
2	9,100	14,600	15,600
4	21,400	31,100	32,900
6	33,400	46,800	49,300
Source: <i>EIR for General Plan 2023</i> , City of Manteca, 2003.			

Freeway Segments

Freeway segment operations were evaluated using the methodology contained in Chapter 21 of the 2000 HCM. The density is calculated using the HCS+ analysis software and is correlated to a LOS designation for both mainline segments and ramp junctions as shown in Table 4.

In the *Guide for the Preparation of Traffic Impact Study* (June 2001), Caltrans endeavors to maintain a target LOS of LOS D on State Highway facilities. This includes freeway mainline, off-ramp diverge, on-ramp merge, and ramp terminal intersections.

**TABLE 4
DENSITY-BASED FREEWAY LEVELS OF SERVICE**

Level of Service	Mainline Density ¹	Ramp Junction Density ¹
A	≤ 11.0	≤ 10.0
B	11.1 to 18.0	10.1 to 20.0
C	18.1 to 26.0	20.1 to 28.0
D	26.1 to 35.0	28.1 to 35.0
E	35.1 to 45.0	> 35.0
F	> 45.0	Demand exceeds capacity.

Note:

1 Measured in vehicles per mile per lane.

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

INTERSECTION LEVELS OF SERVICE

Existing intersection lane configurations and peak-hour turning movement volumes were used to calculate the LOS for the key intersections during the AM and PM peak hours. The results of the LOS analysis for existing conditions are presented in Table 5. The corresponding calculation sheets are contained in Appendix B. The results of the LOS calculations indicate that 19 of the 22 study intersections currently operate at acceptable levels of service (i.e., LOS C or better) during the AM peak hour, with 21 of the 22 study intersections operating at LOS D or better. During the PM peak hour, 15 of the 22 intersections currently operate at acceptable levels of service, with 20 of the 22 study intersections operating at LOS D or better.

PEAK-HOUR SIGNAL WARRANTS ANALYSIS

Peak-hour signal warrants were conducted for all unsignalized study intersections to determine if there was need for the signalization of the intersections. The analysis applied the peak-hour traffic signal warrant recommended in the Federal Highway Administration's *Manual on Uniform Traffic Control Devices (MUTCD)* (2003) and associated State guidelines. The warrants analysis is summarized in Table 5. The corresponding calculation sheets are contained in Appendix C. Two intersections meet the MUTCD peak-hour volume warrant during both the AM and PM peak hours, and two intersections meet the MUTCD peak-hour volume warrant during the PM peak hour only.

**TABLE 5
EXISTING INTERSECTION LEVELS OF SERVICE AND SIGNAL WARRANTS**

Intersection	Peak Hour ¹	Intersection Control	Delay ²	LOS ³	Meets Warrant
1. Airport Way and West Yosemite Avenue	AM PM	Signal	21.0 35.4	C D	N/A N/A
2. Airport Way and Wawona Street	AM PM	Side Street Controlled Stop Sign	4.1 (25.3) 2.4 (25.1)	A (D) A (D)	No No
3. Airport Way and Daniels Street	AM PM	Side Street Controlled Stop Sign	5.0 (46.1) 1.3 (23.9)	A (E) A (D)	No No
4. Airport Way and State Route 120 Westbound Ramps	AM PM	Side Street Controlled Stop Sign	4.2 (20.8) 5.6 (29.7)	A (C) A (D)	Yes Yes
5. Airport Way and State Route 120 Eastbound Ramps	AM PM	Side Street Controlled Stop Sign	5.0 (23.0) 67.3 (>100)	A (C) F (F)	No Yes
6. Airport Way and Atherton Drive	AM PM	Side Street Controlled Stop Sign	4.2 (14.8) 4.4 (21.6)	A (B) A (C)	No No
7. Airport Way and Woodward Avenue	AM PM	All-Way Stop Controlled	8.4 8.8	A A	No No
8. Airport Way and Peach Avenue	AM PM	Side Street Controlled Stop Sign	0.3 (8.7) 0.8 (9.1)	A (A) A (A)	No No
9. Woodward Avenue and Oleander Road	AM PM	Side Street Controlled Stop Sign	1.3 (9.1) 0.7 (9.3)	A (A) A (A)	No No
10. Peach Avenue and Oleander Road	AM PM	Side Street Controlled Stop Sign	4.0 (9.1) 7.9 (9.1)	A (A) A (A)	No No
11. Union Road and West Yosemite Avenue	AM PM	Signal	27.6 36.3	C D	N/A N/A
12. Union Road and Wawona Street	AM PM	Signal	37.4 28.9	D C	N/A N/A
13. Union Road and Daniels Street	AM PM	Side Street Controlled Stop Sign	2.0 (21.6) 2.1 (29.0)	A (C) A (D)	No No
14. Union Road and State Route 120 Westbound Ramps	AM PM	Side Street Controlled Stop Sign	3.0 (13.2) 6.6 (27.3)	A (B) A (D)	Yes Yes
15. Union Road and State Route 120 Eastbound Ramps	AM PM	Side Street Controlled Stop Sign	6.4 (25.3) >100 (>100)	A (D) F (F)	No Yes
16. Union Road and Atherton Drive	Future Intersection				
17. Union Road and Woodward Avenue	AM PM	All-Way Stop Controlled	8.6 9.0	A A	No No
18. Union Road and Peach Avenue	AM PM	Side Street Controlled Stop Sign	0.2 (11.6) 0.2 (10.8)	A (B) A (B)	No No

TABLE 5 (CONTINUED)
EXISTING INTERSECTION LEVELS OF SERVICE AND SIGNAL WARRANTS

Intersection	Peak Hour ¹	Intersection Control	Delay ²	LOS ³	Meets Warrant
19. Woodward Avenue and Moffat Boulevard	AM PM	Side Street Controlled Stop Sign	4.6 (13.3) 4.8 (13.4)	A (B) A (B)	No No
20. State Route 99 Southbound Ramp and Moffat Boulevard	AM PM	Side Street Controlled Stop Sign	1.0 (11.6) 1.1 (12.5)	A (B) A (B)	No No
21. Moffat Boulevard and Austin Road	AM PM	All-Way Stop Controlled	10.5 15.7	A B	No No
22. State Route 99 Northbound Ramps and Austin Road	AM PM	All-Way Stop Controlled	10.1 9.0	B A	No No

Notes:

- 1 AM = morning peak hour, PM = evening peak hour.
- 2 Whole intersection weighted average control delay expressed in seconds per vehicle using methodology described in the 2000 HCM. For side street stop controlled intersections, total control delay for the worst movement is presented in parentheses.
- 3 LOS = Level of service. For side street stop controlled intersections, LOS for the worst movement is shown in parentheses. LOS calculations conducted using the TRAFFIX level of service analysis software package.

Bold highlighting denotes intersections with unacceptable operations (LOS E or F) and that also meet peak-hour volume warrants.

ROADWAY SEGMENT LEVELS OF SERVICE

The results of the LOS analysis for existing roadway conditions are presented in Table 6. The LOS calculations indicate that all 5 study roadways currently operate at acceptable levels of service.

TABLE 6
EXISTING ROADWAY LEVELS OF SERVICE

Roadway Segment	Lanes	Volume ¹	Level of Service
1. Airport Way, North of State Route 120	2	9,500	D
2. Airport Way, South of State Route 120	2	1,900	C
3. Union Road, North of State Route 120	2	10,400	D
4. Union Road, South of State Route 120	2	3,970	C
5. Woodward Avenue, East of Union Road	2	2,780	C

Note:

- 1 Average daily traffic.

FREEWAY OPERATIONS

The peak-hour operations of SR 120 freeway segments and ramps were analyzed under Existing Conditions. The traffic volumes used in the mainline segment analysis were obtained from Caltrans and counted in March 2004. The ramp volumes used in the merge/diverge analysis were taken from the counts conducted at the ramp intersections together with the mainline volumes provided by Caltrans.

Mainline Segments

The results of the LOS analysis for existing freeway mainline conditions are presented in Table 7. The corresponding calculation sheets are contained in Appendix D. The LOS calculations indicate that all eastbound and westbound mainline segments currently operate at acceptable levels of service during both the AM and PM peak hours.

TABLE 7 EXISTING STATE ROUTE 120 MAINLINE LEVELS OF SERVICE				
Travel Direction	Segment	Peak Hour	Density (vehicles per miles per lane)	Level of Service
Eastbound	Yosemite to Airport	AM	17.0	B
		PM	31.6	D
	Airport to Union	AM	17.5	B
		PM	29.2	D
	Union to Main	AM	18.6	C
		PM	26.7	D
Westbound	Main to Union	AM	28.9	D
		PM	21.9	C
	Union to Airport	AM	30.1	D
		PM	20.0	C
	Airport to Yosemite	AM	33.3	D
		PM	19.8	C

Ramp Junctions

The results of the LOS analysis for existing ramp junction conditions are presented in Table 8. The corresponding calculation sheets are contained in Appendix D. The LOS calculations indicate that all ramp junctions currently operate at acceptable levels of service during the AM and PM peak hours.

**TABLE 8
EXISTING STATE ROUTE 120 RAMP JUNCTION LEVELS OF SERVICE**

Travel Direction	Ramp	Merge/Diverge	Peak Hour	Density (vehicles per mile per lane)	Level of Service
Eastbound	Airport Way	Diverge (Off-ramp)	AM	12.2	B
			PM	26.6	C
		Merge (On-ramp)	AM	14.9	B
			PM	25.5	C
	Union Road	Diverge (Off-ramp)	AM	12.7	B
			PM	24.4	C
		Merge (On-ramp)	AM	15.9	B
			PM	23.2	C
Westbound	Union Road	Diverge (Off-ramp)	AM	24.0	C
			PM	17.1	B
		Merge (On-ramp)	AM	26.2	C
			PM	17.2	B
	Airport Way	Diverge (Off-ramp)	AM	25.2	C
			PM	15.2	B
		Merge (On-ramp)	AM	28.7	D
			PM	17.0	B

FIELD OBSERVATIONS

Field observations of the study intersections and roadway segments were conducted during the morning and evening peak periods in January 2006. The intersections were observed to operate generally at the calculated levels of service for each peak period. No significant congestion was noted on the roadway segments.

There are several construction projects in the area. The intersection of Airport Way and Daniels Street is being signalized and improved, with new development under construction west of the intersection. The intersection of Union Road and Atherton Drive is under construction, with new development occurring to the east of the future intersection. The construction continues south along the east side of Union Road to Woodward Avenue.

3. PROJECT CONDITIONS

The impacts of the proposed residential development on the surrounding roadway system are discussed in this chapter. First, the methodology used to estimate the amount of traffic generated by the project is described. Then, the results of the level of service calculations for Project Conditions are presented. Project Conditions are defined as Existing Conditions plus traffic generated by the proposed project. A comparison of intersection operations under Existing and Project Conditions are presented, and the impacts of the project on the study intersections are discussed. Site access and on-site circulation also are addressed in this chapter.

The proposed project is approximately 230 acres and includes construction of 1,074 single-family homes, 57,500 square feet of retail commercial space, and a 20,000-square-foot Boys and Girls Club in the City of Manteca.

TRAFFIC ESTIMATES

The amount of traffic added to the roadway system by proposed development is estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. The first step estimates the amount of added traffic to the roadway network. The second step estimates the direction of travel to and from the project site. The trips are assigned to specific street segments and intersection turning movements during the third step. The results of the process for the proposed Oleander Estates and Sundance projects are described in the following sections.

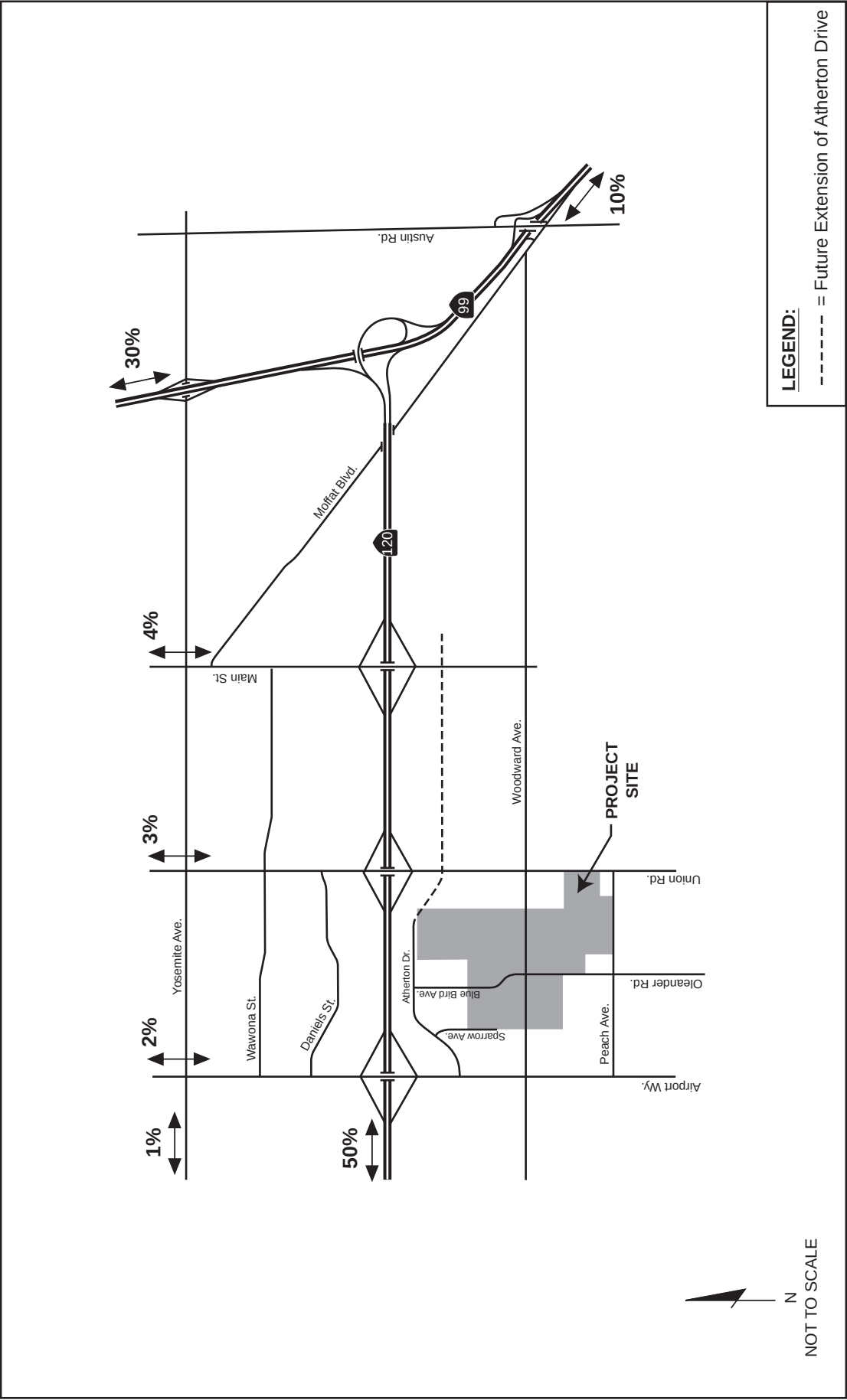
Trip Generation

The amount of traffic added to the surrounding roadway system by the proposed residential (ITE Single-Family Residential 210) and commercial land uses (ITE Shopping Center 820) was estimated by applying trip generation rates appropriate for the AM and PM peak hours as published in *Trip Generation, 7th Edition* by the Institute of Transportation Engineers. Trip generation estimates for the Boys and Girls Club were estimated by applying trip generation rates established in the 2003 *Proposed Alamo YMCA Final Environmental Impact Report*.

The peak-hour trip generation rates and trip estimates are presented in Table 9. The proposed project is estimated to generate 11,912 daily trips, 867 AM peak-hour trips (259 inbound and 608 outbound), and 1,162 PM peak-hour trips (693 inbound and 469 outbound). No reductions were taken for trips within the project's different land uses while some internalization may be expected to occur. Trip generation estimates were calculated without internal trip discounts because of limited commercial development and to provide a more conservative (e.g., worst-case) analysis.

Trip Distribution

The directions of approach and departure for project traffic were estimated based on the existing travel patterns in the area and the relative locations of employment centers and other attractions such as schools, parks, and retail areas. In addition, information provided in the San Joaquin Council of Governments travel demand forecasting model was used to help determine the trip distribution. Figure 6 illustrates the major directions of approach and departure that form the trip distribution pattern for the project.



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Oleander Estates and Sundance Residential

PROJECT TRIP DISTRIBUTION

FIGURE 6

Trip Assignment

The project trips generated from the development were assigned to the roadway system based on the directions of approach and departure discussed above. Figure 7 shows the project trips assigned to each turning movement by intersection. The project trips were added to existing traffic volumes to establish intersection volumes for Project Conditions shown on Figure 8.

**TABLE 9
PROJECT TRIP GENERATION RATES AND ESTIMATES**

Use	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Trip Rates ¹							
Single-Family Residential	8.60	0.18	0.53	0.71	0.54	0.31	0.85
Commercial Shopping Center ²	38.40	0.63	0.40	1.03	1.73	1.87	3.60
Boys & Girls Club ³	23.40	1.64	0.73	2.37	1.10	1.24	2.34
Trip Estimates							
Single-Family Residential (1,074 d.u.)	9,236	190	571	761	572	336	908
Commercial Shopping Center (57.5 ksf)	2,208	36	23	59	99	108	207
Boys & Girls Club (20 ksf)	468	33	14	47	22	25	47
Total	11,912	259	608	867	693	469	1,162

Notes:

- 1 Trip rates are expressed as trips per dwelling unit (d.u.) or per 1,000 square feet (ksf).
- 2 Trip rates estimated using buildout values for the 510,000-square-foot Union Commercial project.
- 3 Daily trip rate determined by estimating PM traffic generates 10% of total daily trips.

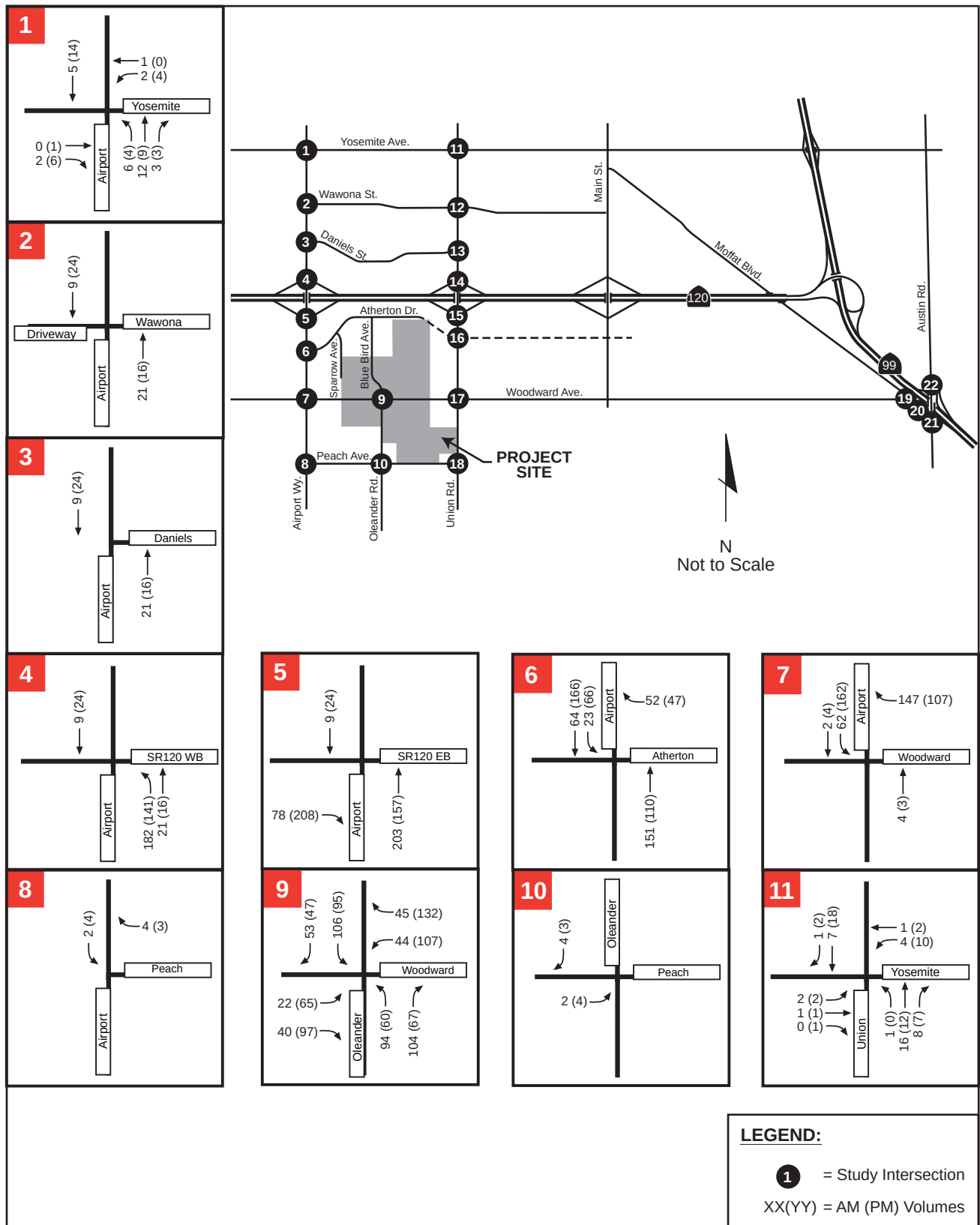
Source: *Trip Generation, 7th Edition*, Institute of Transportation Engineers, 2003.

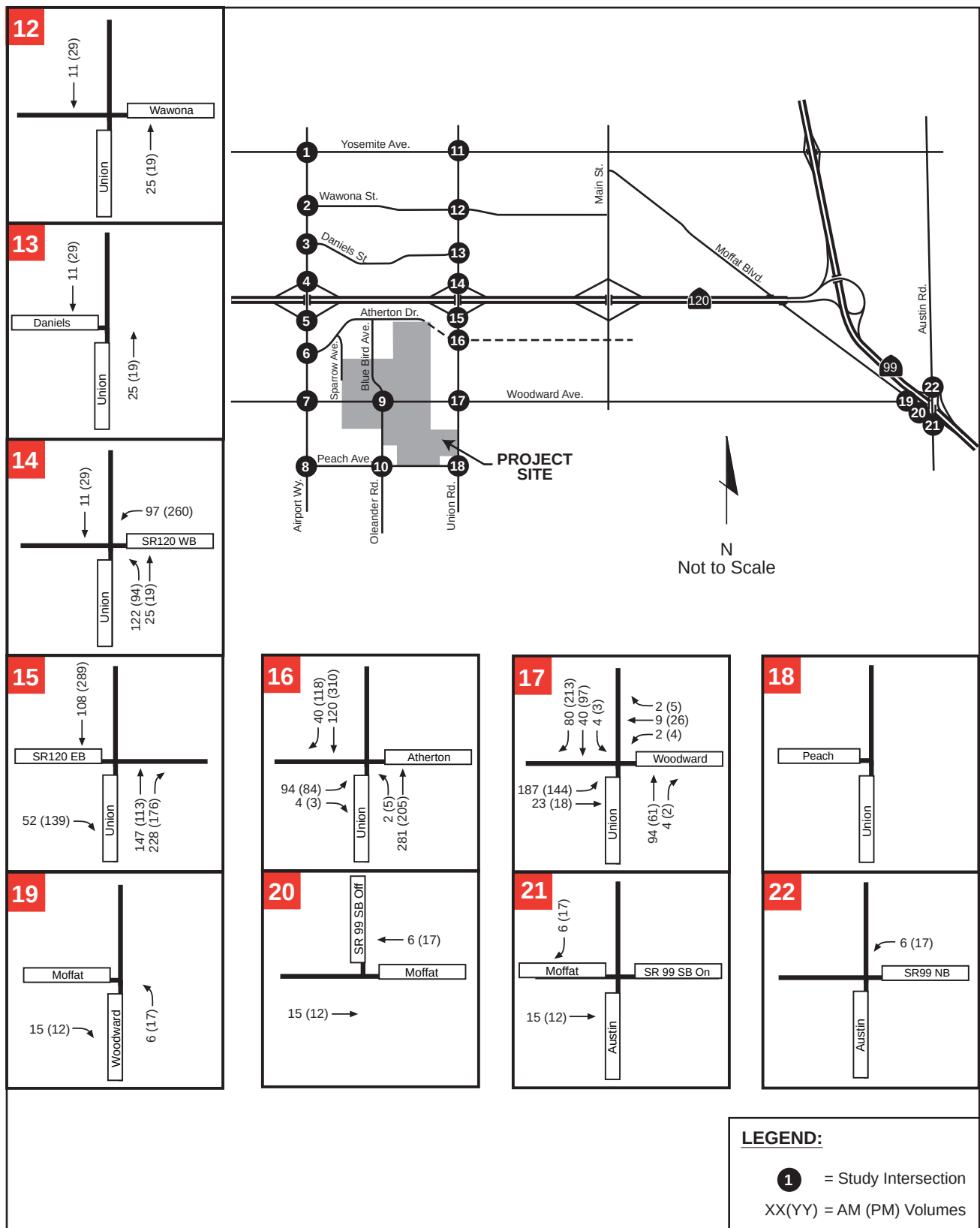
ROADWAY IMPROVEMENTS

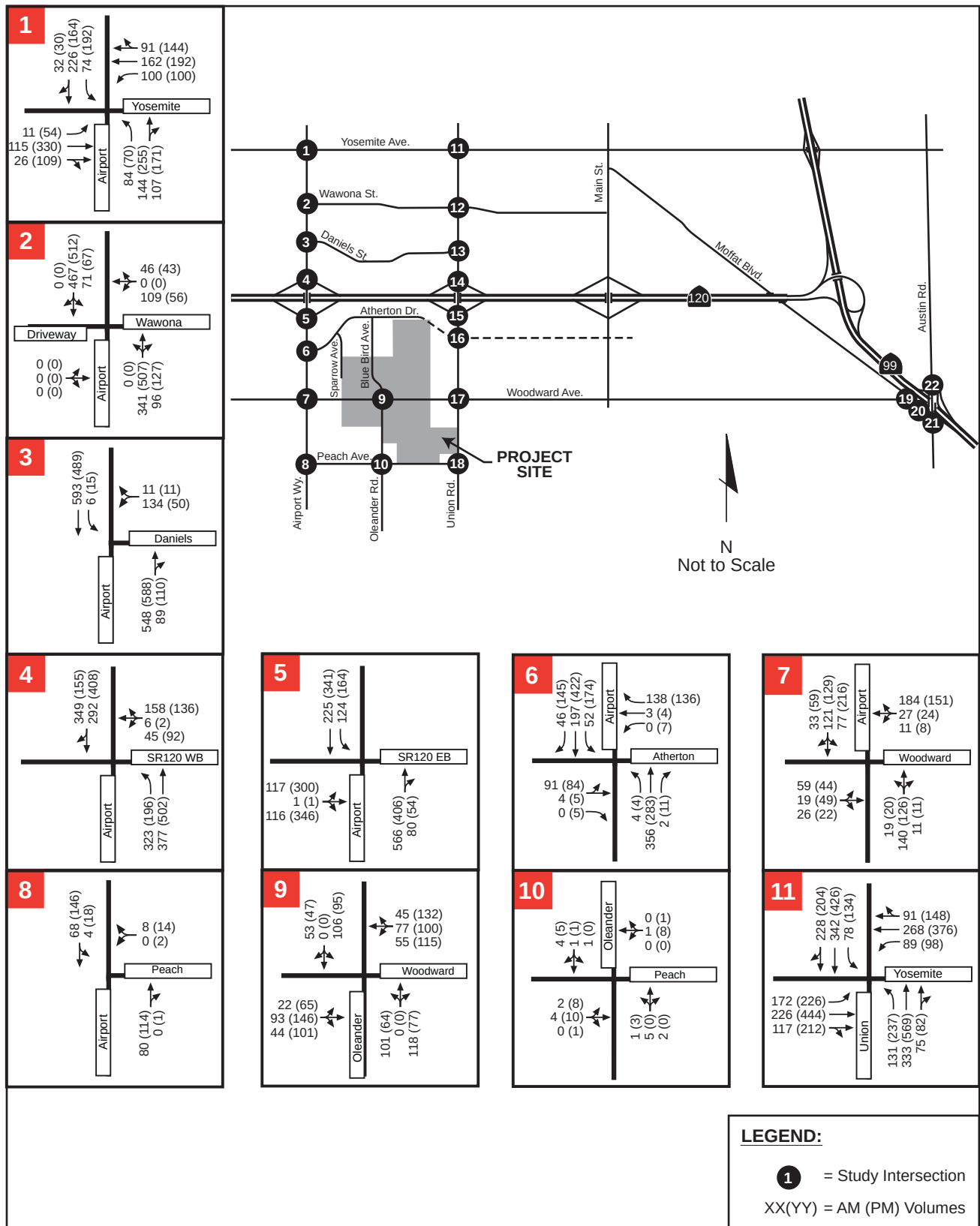
This analysis assumes one roadway improvement will be in place under Project Conditions: the extension of Atherton Drive east to Union Road. This intersection is expected to be completed by the time the proposed project would be constructed. For the purposes of this analysis, it is assumed the intersection of Union Road and Atherton Drive will be side-street stop controlled, with stop signs on Atherton Drive. It is assumed the lane geometry will consist of shared left-through-right lanes on all four intersection legs.

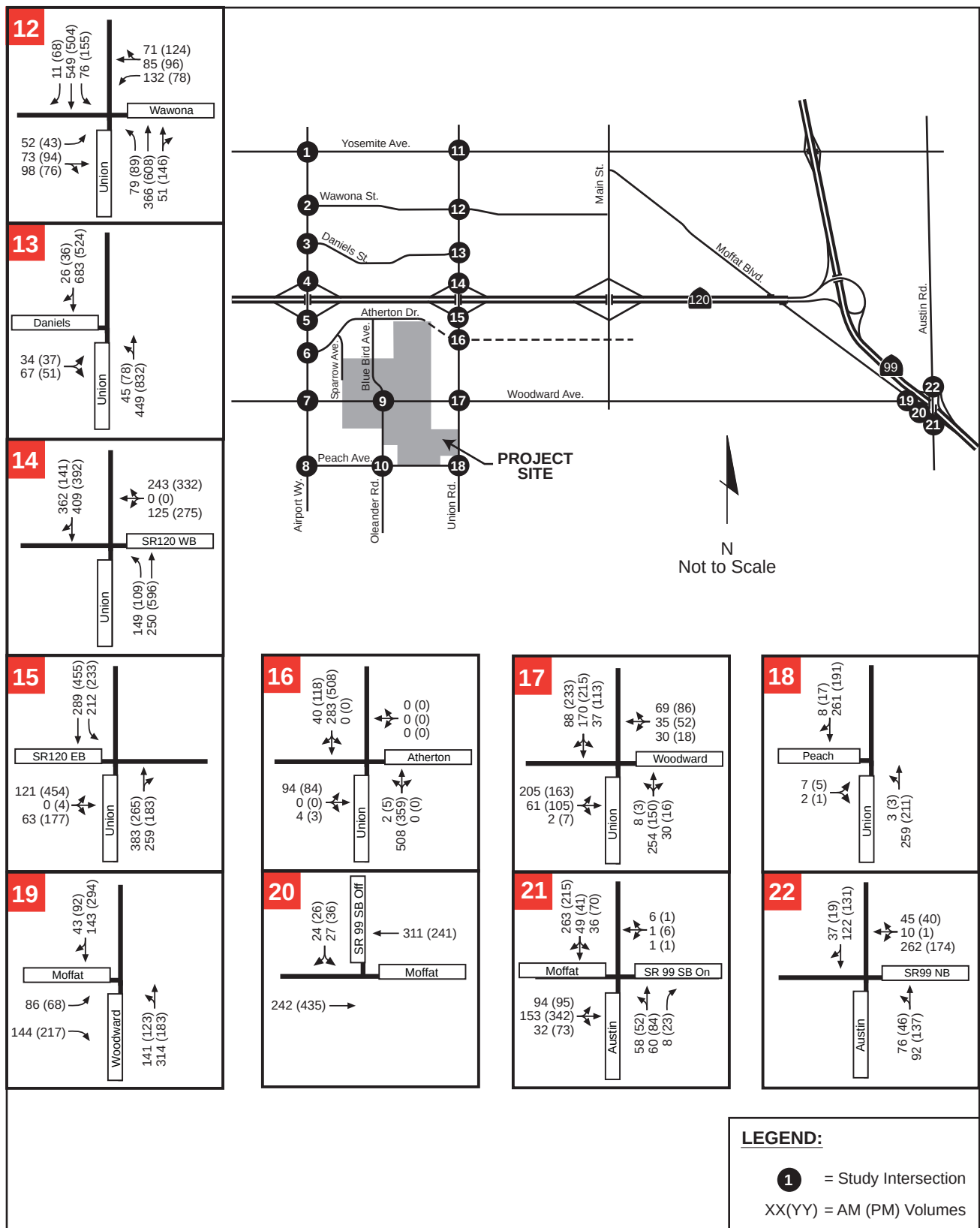
INTERSECTION LEVELS OF SERVICE

Intersection levels of service were calculated with the new traffic added by the proposed project to evaluate the operating conditions of the intersections and identify potential impacts to the local roadway system. The results of the intersection level of service calculations for Project Conditions are presented in Table 10. The levels of service calculation sheets are included in Appendix B.









PEAK-HOUR SIGNAL WARRANTS ANALYSIS

Peak-hour signal warrant analysis was conducted with the new traffic added by the proposed project. The warrants analysis for Project Conditions is summarized in Table 10. The corresponding calculation sheets are contained in Appendix C. Four intersections meet the MUTCD peak-hour volume warrant during both the AM and PM peak hours.

TABLE 10 PROJECT INTERSECTION LEVELS OF SERVICE AND SIGNAL WARRANTS							
Intersection	Peak Hour ¹	Existing		Project		Meets Warrant	Significant Impact
		Delay ²	LOS ³	Delay ²	LOS ³		
1. Airport Way and West Yosemite Avenue	AM	21.0	C	21.2	C	N/A	No
	PM	35.4	D	35.6	D	N/A	No
2. Airport Way and Wawona Street	AM	4.1 (25.3)	A (D)	4.2 (26.9)	A (D)	No	No
	PM	2.4 (25.1)	A (D)	2.5 (26.7)	A (D)	No	No
3. Airport Way and Daniels Street	AM	5.0 (46.1)	A (E)	5.3 (50.3)	A (F)	No	No
	PM	1.3 (23.9)	A (D)	1.3 (25.2)	A (D)	No	No
4. Airport Way and State Route 120 Westbound Ramps	AM	4.2 (20.8)	A (C)	9.2 (51.8)	A (F)	Yes	Yes
	PM	5.6 (29.7)	A (D)	14.0 (82.8)	B (F)	Yes	Yes
5. Airport Way and State Route 120 Eastbound Ramps	AM	5.0 (23.0)	A (C)	7.6 (35.1)	A (E)	Yes	Yes
	PM	67.3 (>100)	F (F)	>100 (>100)	F (F)	Yes	No
6. Airport Way and Atherton Drive	AM	4.2 (14.8)	A (B)	5.1 (26.4)	A (D)	No	No
	PM	4.4 (21.6)	A (C)	7.8 (71.9)	A (F)	No	No
7. Airport Way and Woodward Avenue	AM	8.4	A	9.5	A	No	No
	PM	8.8	A	11.5	B	No	No
8. Airport Way and Peach Avenue	AM	0.3 (8.7)	A (A)	0.6 (8.7)	A (A)	No	No
	PM	0.8 (9.1)	A (A)	0.9 (9.1)	A (A)	No	No
9. Woodward Avenue and Oleander Road	AM	1.3 (9.1)	A (A)	7.9 (14.2)	A (B)	No	No
	PM	0.7 (9.3)	A (A)	7.5 (22.7)	A (C)	No	No
10. Peach Avenue and Oleander Road	AM	4.0 (9.1)	A (A)	3.7 (9.1)	A (A)	No	No
	PM	7.9 (9.1)	A (A)	7.4 (9.1)	A (A)	No	No
11. Union Road and West Yosemite Avenue	AM	27.6	C	27.7	C	N/A	No
	PM	36.3	D	36.5	D	N/A	No
12. Union Road and Wawona Street	AM	37.4	D	39.5	D	N/A	No
	PM	28.9	C	32.2	C	N/A	No
13. Union Road and Daniels Street	AM	2.0 (21.6)	A (C)	2.1 (22.5)	A (C)	No	No
	PM	2.1 (29.0)	A (D)	2.2 (31.5)	A (D)	No	No
14. Union Road and State Route 120 Westbound Ramps	AM	3.0 (13.2)	A (B)	16.9 (66.6)	C (F)	Yes	Yes
	PM	6.6 (27.3)	A (D)	>100 (>100)	F (F)	Yes	Yes
15. Union Road and State Route 120 Eastbound Ramps	AM	6.4 (25.3)	A (D)	10.8 (66.7)	B (F)	Yes	Yes
	PM	>100 (>100)	F (F)	>100 (>100)	F (F)	Yes	No

TABLE 10 (CONTINUED)
PROJECT INTERSECTION LEVELS OF SERVICE AND SIGNAL WARRANTS

Intersection	Peak Hour ¹	Existing		Project		Meets Warrant	Significant Impact
		Delay ²	LOS ³	Delay ²	LOS ³		
16. Union Road and Atherton Drive	AM PM	Future Intersection		13.3 17.3	B C	No No	No No
17. Union Road and Woodward Avenue	AM PM	8.6 9.0	A A	12.3 20.2	B C	No No	No No
18. Union Road and Peach Avenue	AM PM	0.2 (11.6) 0.2 (10.8)	A (B) A (B)	0.2 (11.6) 0.2 (10.8)	A (B) A (B)	No No	No No
19. Woodward Avenue and Moffat Boulevard	AM PM	4.6 (13.3) 4.8 (13.4)	A (B) A (B)	4.8 (13.2) 5.1 (13.7)	A (B) A (B)	No No	No No
20. State Route 99 Southbound Ramp and Moffat Boulevard	AM PM	1.0 (11.6) 1.1 (12.5)	A (B) A (B)	1.0 (11.7) 1.1 (12.7)	A (B) A (B)	No No	No No
21. Moffat Boulevard and Austin Road	AM PM	10.5 15.7	A B	10.8 16.7	B C	No No	No No
22. State Route 99 Northbound Ramps and Austin Road	AM PM	10.1 9.0	B A	10.1 9.1	B A	No No	No No
Notes: 1 AM = morning peak hour, PM = evening peak hour. 2 Whole intersection weighted average control delay expressed in seconds per vehicle using methodology described in the 2000 HCM. For side street stop controlled intersections, total control delay for the worst movement is presented in parentheses. 3 LOS = Level of service. For side street stop controlled intersections, LOS for the worst movement is shown in parentheses. LOS calculations conducted using the TRAFFIX level of service analysis software package. Bold highlighting denotes intersections with unacceptable operations (LOS E or F) and that also meet peak-hour volume warrants.							

OFF-RAMP QUEUING ANALYSIS

The queues from the level of service calculation sheets were used to determine the increase in queues between Existing and Project Conditions. The results are presented in Table 11.

TABLE 11
SR 120 OFF-RAMP QUEUES AT UNSIGNALIZED INTERCHANGE INTERSECTIONS

Interchange	Peak Hour ¹	Shared Off-Ramp Queue ²	
		Existing	Project
Airport Way EB	AM	3	5
	PM	21	45
Airport Way WB	AM	3	6
	PM	4	9
Union Road EB	AM	3	7
	PM	28	59
Union Road WB	AM	2	11
	PM	6	48

Notes:
1 AM = morning peak hour, PM = evening peak hour.
2 Rounded to the next largest whole vehicle.

INTERSECTION IMPACT CRITERIA

Signalized Intersections

For this analysis, traffic impacts at signalized intersections are defined to occur when the addition of project traffic causes:

- 1) intersection operations to deteriorate from an acceptable level (LOS D or better) under Existing Conditions to an unacceptable level (LOS E or F); or
- 2) exacerbation of unacceptable operations at study intersections by increasing the volume-to-capacity (V/C) ratio by 0.01 or more at an intersection operating at LOS E or F under Existing Conditions.

Based on the project impact criteria listed above, the proposed project will ***not cause a significant impact*** at any of the signalized study intersections (Airport Way and West Yosemite Avenue, Union Road and West Yosemite Avenue, and Union Road and Wawona Street).

Unsignalized Intersections

A significant impact at an unsignalized intersection is defined to occur when:

- 1) the addition of project traffic causes intersection operations to deteriorate from an acceptable level (LOS D or better) under Existing Conditions to an unacceptable level (LOS E or F) under Project Conditions and the turning movement volumes exceed the peak-hour traffic signal warrant criteria from the 2003 *Manual on Uniform Traffic Control Devices*.
- 2) the addition of project traffic exacerbates unacceptable operations (LOS E or F) under Existing Conditions and the turning movement volumes exceed the peak-hour traffic signal warrant criteria from the 2003 *Manual on Uniform Traffic Control Devices*.

- 3) at freeway intersections the off-ramp queue length increases by 5 or more vehicles.

Based on the project impact criteria listed above, the proposed project will cause a **significant impact** to the following four study intersections:

1. Airport Way and State Route 120 Westbound Ramps (both AM and PM peak hours)
2. Airport Way and State Route 120 Eastbound Ramps (both AM and PM peak hours)
3. Union Road and State Route 120 Westbound Ramps (both AM and PM peak hours)
4. Union Road and State Route 120 Eastbound Ramps (both AM and PM peak hours)

For intersections (such as Airport Way and Daniels Street) that currently operate at an unacceptable level of service, there is not a significant impact when the intersection does not meet or exceed the peak-hour signal warrant.

INTERSECTION MITIGATION MEASURES

The Airport Way and Union Road intersections with the SR 120 ramps are all projected to be significantly impacted by the proposed project. It is recommended that these intersections be signalized to mitigate the significant impact of the proposed project. These mitigation measures should be implemented before buildout of the proposed project to ensure adequate levels of service at these study intersections. The intersection of Airport Way and SR 120 Eastbound ramps is projected to deteriorate to an unacceptable level of service with the addition of approximately 300 residential units on the project site. Funding for these improvements would be from the traffic impact fees paid by the applicant. Table 12 summarizes the results of the LOS analysis for Project Conditions with mitigation.

All four of the study intersections with SR 120 are projected to impact the queue lengths at the off-ramp legs of the intersections. It is recommended that these intersections provide additional width to accommodate turn pockets. The westbound intersection off-ramps at Airport Way and Union Road should widen the approaches to provide separate left-turn pockets to accommodate the additional project-generated traffic. The eastbound intersection off-ramps at Airport Way and Union Road should widen the approaches to provide separate right-turn pockets to accommodate the additional project-generated traffic. These improvements may require widening of the off-ramps to accommodate the additional lanes. Funding for these improvements would be from the traffic impact fees paid by the applicant. Coordination is required between Caltrans and the City of Manteca to implement these mitigation measures.

ROADWAY SEGMENT LEVELS OF SERVICE

Roadway level of service analysis was conducted with the new traffic added by the proposed project. The results of the LOS analysis for Project Conditions are summarized in Table 13. The LOS calculations indicate that one roadway segment is projected to degrade one level of service. The segment of Union Road south of SR 120 is projected to deteriorate from LOS C to LOS D under Project Conditions.

**TABLE 12
MITIGATED PROJECT INTERSECTION LEVELS OF SERVICE**

Intersection	Peak Hour ¹	Intersection Control	Delay ²	LOS ³
4. Airport Way and State Route 120 Westbound Ramps	AM PM	Signal	25.5 17.1	C B
5. Airport Way and State Route 120 Eastbound Ramps	AM PM	Signal	17.4 33.8	B C
14. Union Road and State Route 120 Westbound Ramps	AM PM	Signal	31.6 29.5	C C
15. Union Road and State Route 120 Eastbound Ramps	AM PM	Signal	18.4 34.3	B C

Notes:

- 1 AM = morning peak hour, PM = evening peak hour.
- 2 Whole intersection weighted average control delay expressed in seconds per vehicle using methodology described in the 2000 HCM.
- 3 LOS = Level of service. LOS calculations conducted using the TRAFFIX level of service analysis software package.

**TABLE 13
PROJECT ROADWAY LEVELS OF SERVICE**

Roadway Segment	Lanes	Existing		Project	
		Volume ¹	LOS ²	Volume ¹	LOS ²
1. Airport Way, North of State Route 120	2	9,500	D	9,920	D
2. Airport Way, South of State Route 120	2	1,900	C	5,890	C
3. Union Road, North of State Route 120	2	10,400	D	10,890	D
4. Union Road, South of State Route 120	2	3,970	C	11,310	D
5. Woodward Avenue, East of Union Road	2	2,780	C	3,360	C

Note:

- 1 Average daily traffic.
- 2 LOS = Level of service.

ROADWAY SEGMENT IMPACT CRITERIA

A significant impact on a roadway segment is defined to occur when the addition of project traffic causes roadway operations to deteriorate from an acceptable level (LOS D or better) under Existing Conditions to an unacceptable level (LOS E or F) under Project Conditions.

Based on the criteria listed above, the proposed project would **not have a significant impact** to the study roadway segments.

FREEWAY OPERATIONS

Mainline Segments

Freeway mainline LOS analysis was conducted with the new traffic added by the proposed project. The results of the LOS analysis for Project Conditions are summarized in Table 14. The corresponding calculation sheets are contained in Appendix D. The LOS calculations indicate that the operations on the westbound mainline segment between Airport Way and Yosemite Avenue will deteriorate to LOS D from LOS E during the AM peak hour, as will the eastbound mainline segment between Yosemite Avenue and Airport Way during the PM peak hour. All other mainline segments will continue to operate at existing levels of service.

TABLE 14 PROJECT STATE ROUTE 120 MAINLINE LEVELS OF SERVICE							
Travel Direction	Segment	Peak Hour	Existing		Project		Significant Impact
			Density ¹	LOS ²	Density ¹	LOS ²	
Eastbound	Yosemite to Airport	AM	17.0	B	18.3	C	No
		PM	31.6	D	36.1	E	Yes
	Airport to Union	AM	17.5	B	18.0	B	No
		PM	29.2	D	30.7	D	No
	Union to Main	AM	18.6	C	20.9	C	No
		PM	26.7	D	28.4	D	No
Westbound	Main to Union	AM	28.9	D	29.8	D	No
		PM	21.9	C	24.5	C	No
	Union to Airport	AM	30.1	D	31.4	D	No
		PM	20.0	C	20.9	C	No
	Airport to Yosemite	AM	33.3	D	37.8	E	Yes
		PM	19.8	C	22.2	C	No
Note: 1 Measured in vehicles per mile per lane. 2 LOS = Level of service.							

Ramp Junctions

Freeway ramp junction LOS analysis was conducted with the new traffic added by the proposed project. The results of the LOS analysis for Project Conditions are summarized in Table 15. The corresponding calculation sheets are contained in Appendix D. The LOS calculations indicate that the operations on the eastbound Airport Way off-ramp will deteriorate to LOS D from LOS C during the PM peak hour. All other ramp junctions will continue to operate at existing levels of service.

**TABLE 15
PROJECT STATE ROUTE 120 RAMP LEVELS OF SERVICE**

Travel Direction	Ramp	Merge/Diverge	Peak Hour	Existing		Project		Significant Impact
				Density ¹	LOS ²	Density ¹	LOS ²	
Eastbound	Airport Way	Diverge (Off-ramp)	AM	12.2	B	13.5	B	No
			PM	26.6	C	30.1	D	No
		Merge (On-ramp)	AM	14.9	B	15.4	B	No
			PM	25.5	C	26.8	C	No
	Union Road	Diverge (Off-ramp)	AM	12.7	B	13.2	B	No
			PM	24.4	C	25.8	C	No
Westbound	Union Road	Diverge (Off-ramp)	AM	24.0	C	25.0	C	No
			PM	17.1	B	19.7	B	No
		Merge (On-ramp)	AM	26.2	C	27.2	C	No
			PM	17.2	B	18.0	B	No
	Airport Way	Diverge (Off-ramp)	AM	25.2	C	26.4	C	No
			PM	15.2	B	16.1	B	No
		Merge (On-ramp)	AM	28.7	D	31.4	D	No
			PM	17.0	B	19.1	B	No

Note:

1 Measured in vehicles per mile per lane.

2 LOS = Level of service.

FREEWAY OPERATIONS IMPACT CRITERIA

A significant impact on a freeway mainline segment or ramp is defined to occur when the addition of project traffic causes freeway operations to deteriorate from an acceptable level (LOS D or better) under Existing Conditions to an unacceptable level (LOS E or F) under Project Conditions, or the project adds traffic to freeway segments already operating at unacceptable levels of service (LOS E or F).

Based on the criteria listed above, the proposed project will cause a **significant impact** at the following freeway facilities (see Table 13):

Eastbound SR 120, Yosemite Avenue to Airport Way (PM peak hour)

Westbound SR 120, Airport Way to Yosemite Avenue (AM peak hour)

During the AM peak hour the SR 120 westbound mainline segment from Airport Way to Yosemite Avenue is projected to degrade to an unacceptable level of service (LOS E) under Project Conditions. During the PM peak hour the SR 120 eastbound mainline segment from Yosemite Avenue to Airport Way is projected to degrade to an unacceptable level of service (LOS E) under Project Conditions.

FREEWAY OPERATIONS MITIGATION MEASURES

It should be noted that the freeway mainline level of service on westbound SR 120 between Airport Way and Yosemite Avenue is currently LOS D- under Existing Conditions. Buildout of the project would occur over the next several years, during which time regional traffic growth on SR 120 would result in the freeway mainline degrading to LOS E/F Conditions before the Proposed Project is fully occupied (see Cumulative Conditions).

The widening of SR 120 from four to six lanes is identified in the San Joaquin Council of Governments (SJCOG) Regional Transportation Plan as a Tier 1 improvement, but is currently not funded for design and construction. Signalizing the intersection of Airport Way and SR 120 westbound ramps would marginally improve the operations of the mainline segment by dispersing the approximately 180 vehicles accessing the freeway during the morning peak hour; however, levels of service would remain unacceptable.

Therefore, for the purpose of the Environmental Impact Report, this impact **would be considered significant and unavoidable** under Existing Plus Project Conditions.

PEDESTRIAN, BICYCLE, AND TRANSIT IMPACTS AND MITIGATION

The pedestrian, bicycle, and transit operations were analyzed to determine if the project would create a significant impact on any of these facilities. The criteria used to analyze the impacts is presented below:

Transit System

- 1) Create the demand for public transit service above that which is provided, or planned to be provided;
- 2) Disrupt or interfere with existing or planned public transit services or facilities; or
- 3) Create an inconsistency with policies concerning transit systems set forth in the General Plan for the City of Manteca

Bicycle and Pedestrian

- 1) Disrupt or interfere with existing or planned bicycle or pedestrian facilities;
- 2) Create an unmet need for bicycle or pedestrian facilities; or
- 3) Create an inconsistency with policies related to bicycle or pedestrian systems set forth in the General Plan for the City of Manteca

Currently there are no transit facilities in the vicinity of the project site. Typical weekday activities within the proposed development would create a demand for transit facilities for those who would use public transit to access jobs or other developments outside the project site. Because the proposed project would create demand for public transit above that which is provided, the proposed project would have a **significant impact on the transit facilities**.

Currently there are no bicycle facilities in the vicinity of the project site. Typical weekday activities (biking to work, exercising, etc.) would create an unmet demand for bicycle facilities along Airport Way, Union Road, and Woodward Avenue. Therefore, the proposed project would have a **significant impact on the bicycle facilities**.

Based on the site plan presented on Figure 2, the project includes sidewalks throughout the project site and pedestrian connections to the commercial development to the north. These facilities would adequately serve the pedestrian demand created by the proposed project by providing connections to surrounding land uses with sidewalks. Therefore, the project would have a **less than significant impact on the pedestrian facilities**.

The proposed project should coordinate with the City of Manteca and the San Joaquin Regional Transit District (SJRTD) to determine the appropriate transit facilities necessary to serve the proposed development at such time that expected ridership levels would warrant the service and funding is available. With the implementation of the necessary transit facilities, the project's impact would be mitigated.

The proposed project should also coordinate with the City of Manteca to determine the specific bicycle facilities improvements required to mitigate the bicycle impacts. Providing dedicated bike lanes, bike routes, or other bicycle improvements would mitigate the project's impact.

SITE ACCESS AND ON-SITE CIRCULATION

The proposed site plan is shown in Figure 2. The project provides continuity with the surrounding street network, establishing connections to the existing subdivision along the northern project boundary and creating a series of new connections to existing roadways through the project site and along its southern and eastern boundaries.

The internal roadway system reflects the layout of other subdivisions within the City of Manteca. Vehicular circulation appears adequate. All roadway segments should meet cross section standards established by the City, include sidewalks for pedestrians, and create bicycle facilities as described in the City's 2003 *Bicycle Master Plan*.

Pedestrian circulation should be enhanced in selected areas to provide easier access to parks, potential transit stops, bicycle facilities, and the surrounding community. Figure 9 identifies the enhancements, which can include new pedestrian paths interconnecting the residential areas.

4. CUMULATIVE CONDITIONS

This chapter presents an analysis of Cumulative Conditions with and without the proposed project. Cumulative No Project Conditions is defined as traffic volumes obtained from the San Joaquin Council of Governments (SJCOG) travel demand forecasting model for the future horizon year of 2010. Trips from the proposed project were added to the Cumulative No Project Conditions to obtain Cumulative With Project Conditions. This chapter describes the procedure used to determine the cumulative traffic volumes and the results of the level of service analysis for Cumulative Conditions.

TRAFFIC ESTIMATES

SJCOG's model was used to develop traffic volumes for Cumulative No Project Conditions. The SJCOG Model includes the Cities of Manteca and Lathrop, the remaining areas of San Joaquin County, and adjacent Stanislaus, Sacramento Valley, and Bay Area Counties. In addition to the projected land uses under 2010 conditions, a list of approved and pending projects provided by City of Manteca staff (see Appendix E) was used to estimate 2010 volumes. The approved and pending project descriptions were used as inputs to the SJCOG model and included in the model runs.

In order to determine future No Project traffic volumes, the projected turning movement growth was added to existing morning and evening peak hour traffic volumes as shown in Figure 5 using the following formula:

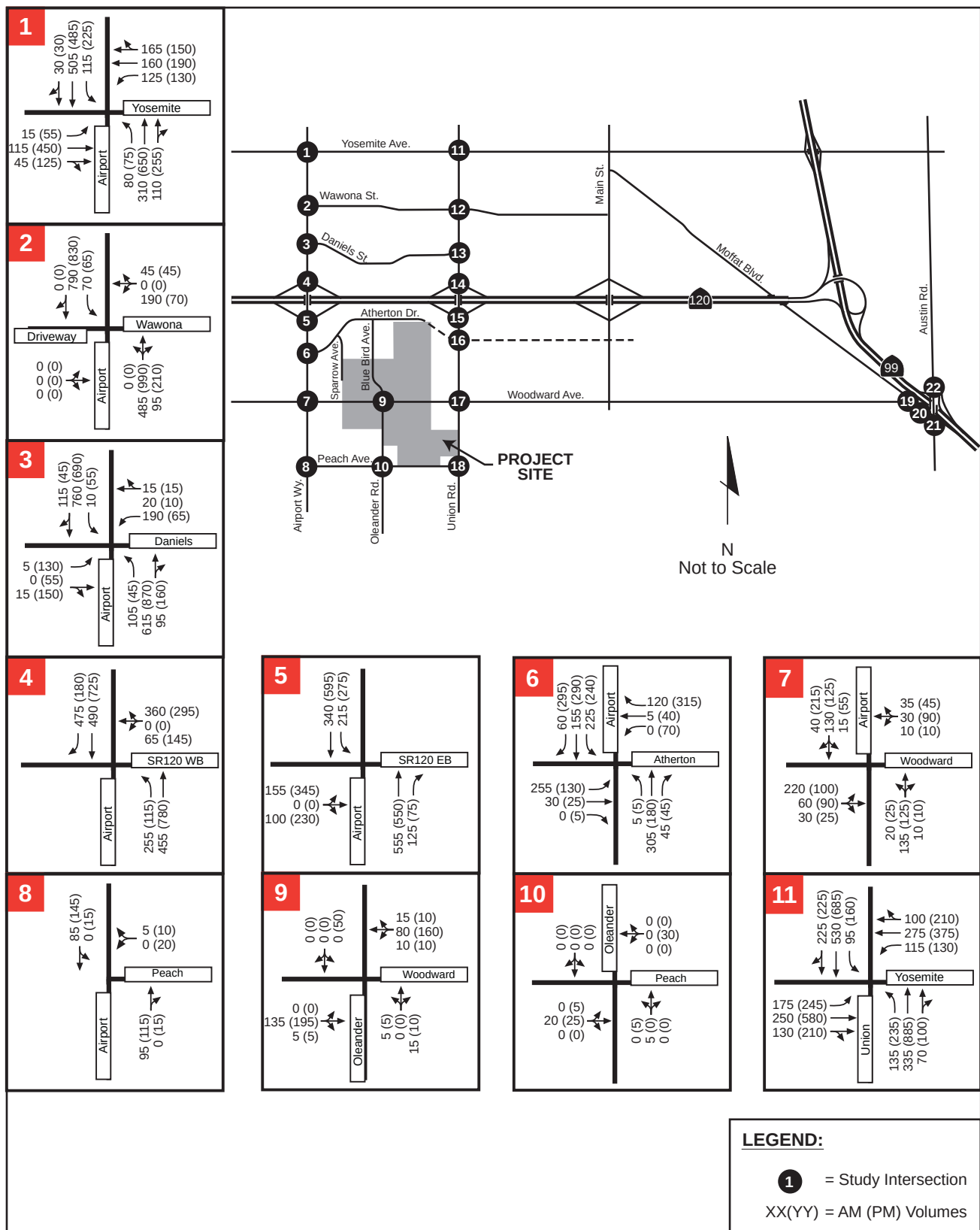
Existing Turning Movement Volume + (2010 SJCOG Turning Movement – 2000 SJCOG Turning Movement)

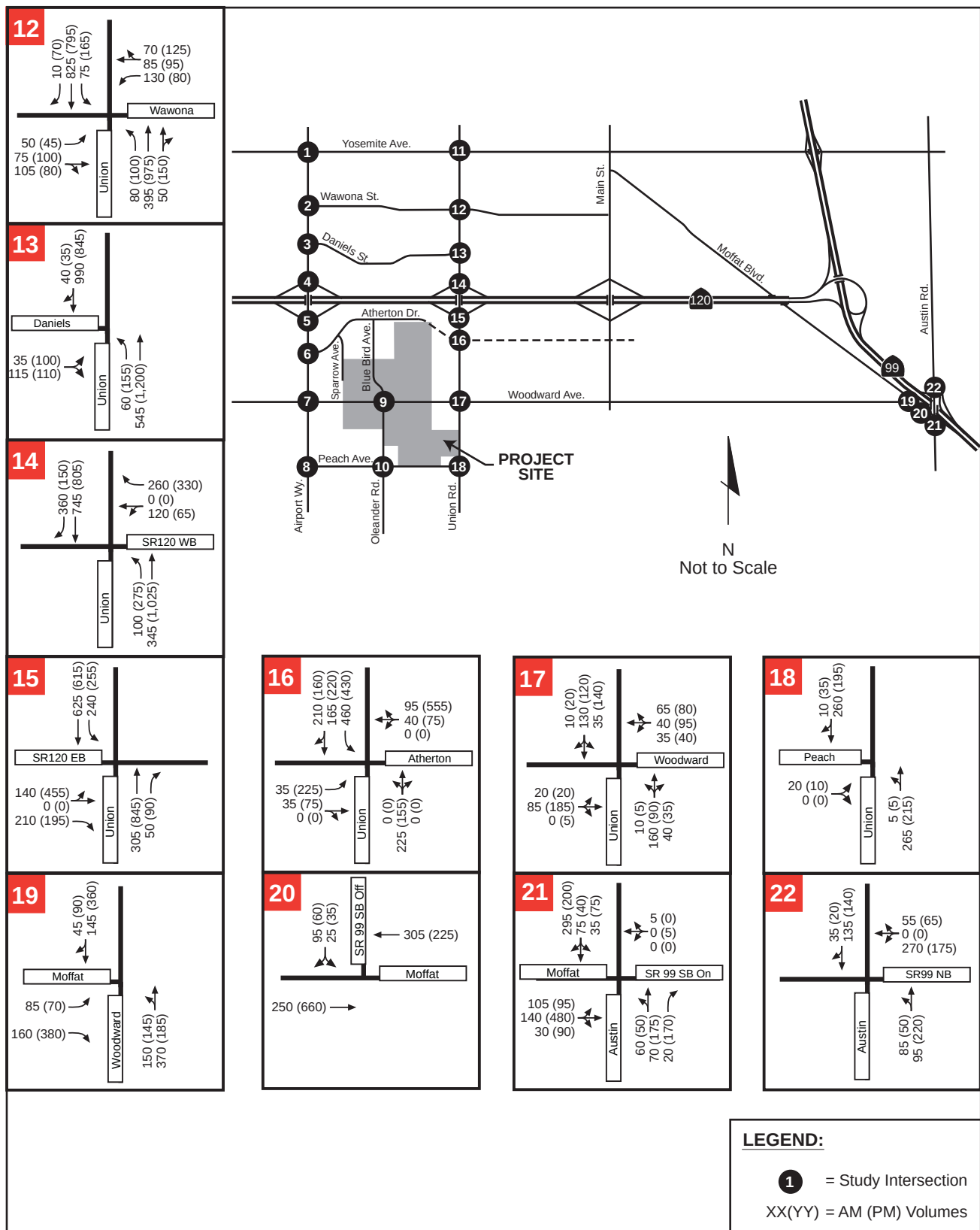
Figure 10 presents the volumes for Cumulative No Project Conditions for the 22 study intersections for AM and PM peak hour conditions. The trips generated by the proposed project (as shown in Figure 7) were added to these volumes, and the resulting volumes for Cumulative With Project Conditions are shown in Figure 11.

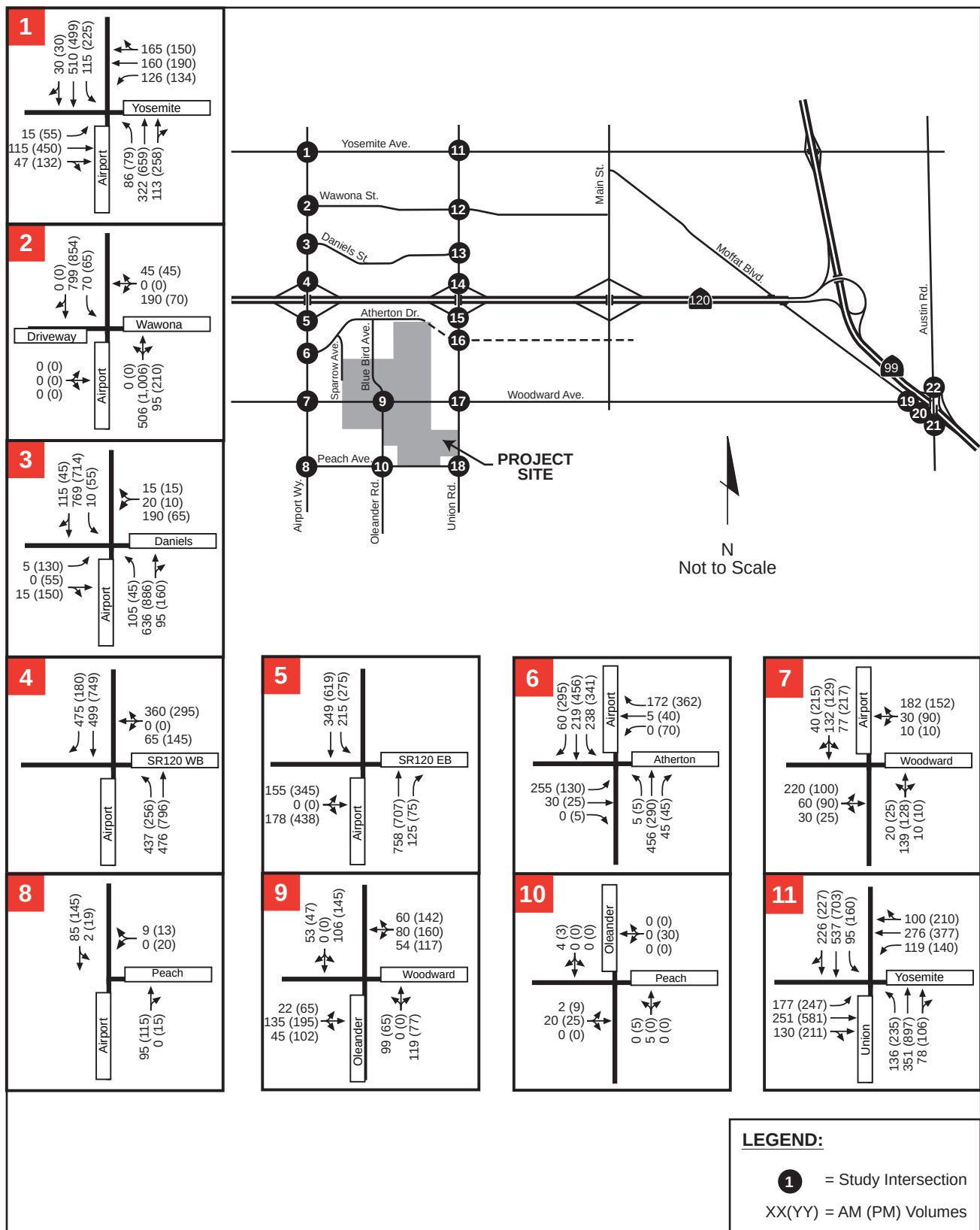
ROADWAY IMPROVEMENTS

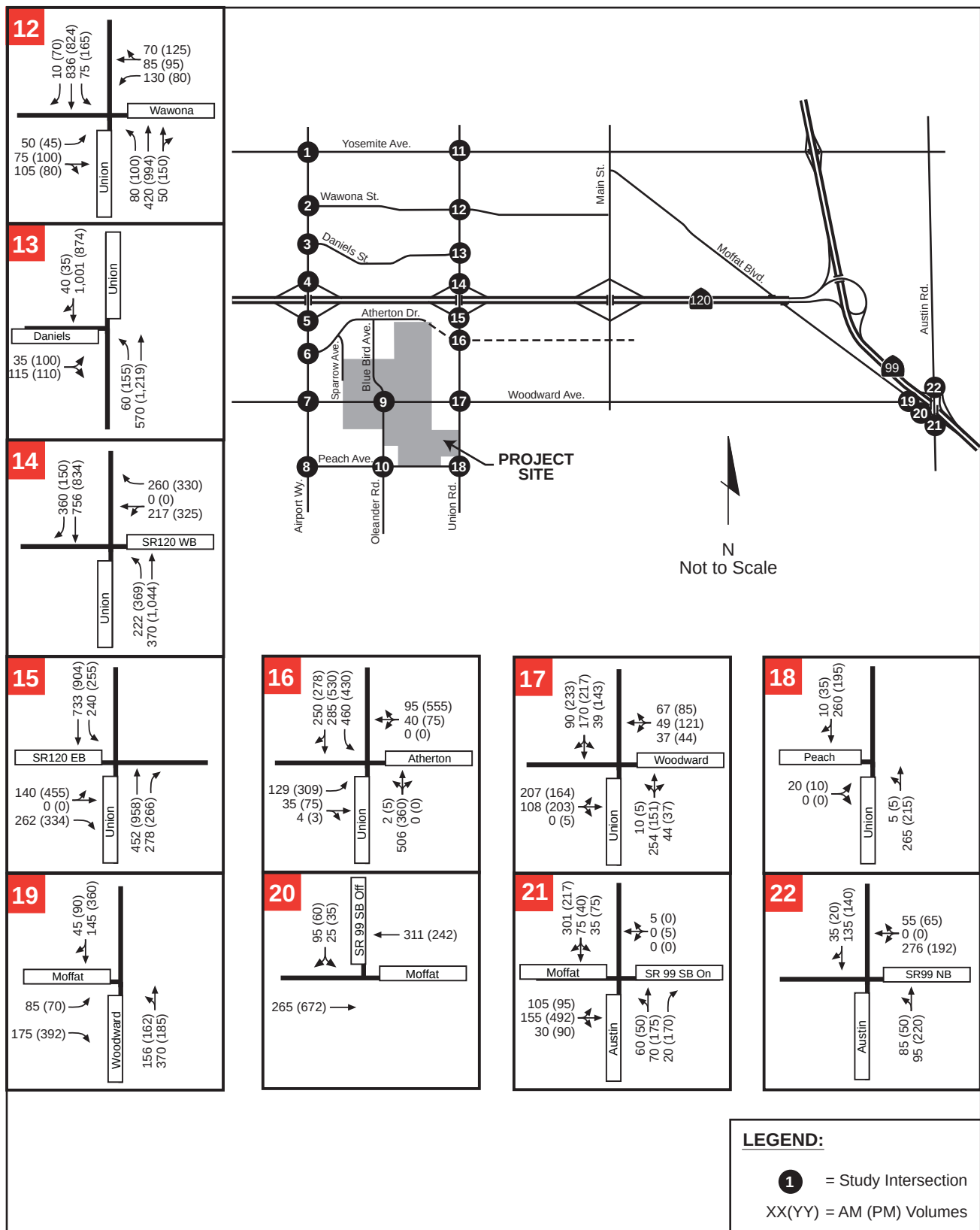
The City of Manteca General Plan identifies roadway improvements throughout its jurisdiction based on daily roadway segment levels of service. The improvements identified in the General Plan relate to widening the roadways to accommodate the projected volumes associated with full buildout of the City of Manteca General Plan. On the other hand, specific intersection geometries and improvements are not identified in the General Plan.

Therefore, intersection geometries and controls needed to provide acceptable levels of service (LOS D or better) at the study intersections for Cumulative No Project Conditions scenario was developed. The peak-hour signal warrants were conducted under Cumulative No Project Conditions to determine the need for a signal under Cumulative Conditions. If the peak-hour signal warrant was exceeded under Cumulative No Project Conditions, the study intersection was assumed to be signalized. The intersection controls under Cumulative No Project Conditions are shown in Table 14.









In addition, lane configurations were modified to reflect geometries that would be consistent with the widening of the roadways identified in the General Plan. The following list of improvements were included under Cumulative Conditions to reflect the future roadways and intersections:

- Airport Way and West Yosemite Avenue (add one northbound and southbound through lane)
- Airport Way and Wawona Street (signalize and modify southbound approach to provide one through lane and one left-turn lane)
- Airport Way and Daniels Street (signalize and provide west leg with one left-turn lane and one shared through/right-turn lane, add separate northbound left-turn lane, provide east leg with a separate left-turn lane and shared through/right-turn lane, and provide a shared through/right-turn lane)
- Airport Way and State Route 120 Westbound Ramps (signalize and provide one through lane and one separate tight-turn lane on the southbound approach)
- Airport Way and State Route 120 Eastbound Ramps (signalize and provide one through lane and one separate tight-turn lane on the northbound approach)
- Airport Way and Atherton Drive (signalize and provide one left-turn lane, one through lane, and one separate right-turn lane)
- Woodward Avenue and Oleander Road (provide all-way stop controlled intersection with the addition of a north leg))
- Union Road and Daniels Street (signalize and modify northbound approach to provide one separate through lane and one separate left-turn lane and provide separate right and left-turn lanes on the eastbound approach)
- Union Road and State Route 120 Westbound Ramps (signalize and modify southbound approach to provide one separate through lane and one separate right-turn lane and provide separate right and through/left-turn lanes on the westbound approach)
- Union Road and State Route 120 Eastbound Ramps (signalize and modify northbound approach to provide one separate through lane and one separate right-turn lane and provide separate right and through/left-turn lanes on the eastbound approach)
- Union Road and Atherton Drive (signalize and provide separate left-turn lanes and shared through/right-turn lanes on all four legs)
- Moffat Boulevard and Austin Road (signalize with existing lane geometries)

The following study intersections were assumed to remain unchanged under Cumulative Conditions:

- Airport Way and Woodward Avenue
- Airport Way and Peach Avenue
- Peach Avenue and Oleander Road
- Union Road and West Yosemite Avenue
- Union Road and Wawona Street
- Union Road and Woodward Avenue
- Union Road and Peach Avenue
- Woodward Avenue and Moffat Boulevard
- Moffat Boulevard and State Route 99 Southbound Ramp
- State Route 99 Northbound Ramps and Austin Road

Cumulative With Project Conditions assumed the same controls as Cumulative No Project Conditions. Figure 10 presents the lane geometries assumed under Cumulative No Project Conditions. It should be noted that analyzing the study intersections without these above described modifications would result in unacceptable operations at the study intersections. In consultation with City staff, these modifications were recommended for the cumulative analysis. These improvements are funded through the traffic impacts fees paid by new developments.

INTERSECTION LEVELS OF SERVICE

Intersection operations were evaluated with level of service calculations under Cumulative No Project and Cumulative With Project Conditions, and the results are summarized in Tables 15 and 16. As discussed above, with the assumed intersection geometries and controls, all the study intersections would operate at acceptable levels of service (LOS D or better) under Cumulative No Project Conditions. With the addition of project-generated traffic, the following intersections are projected to degrade to an unacceptable level of service:

Airport Way and State Route 120 Eastbound Ramps (signalized, PM peak hour only at LOS F)

Union Road and Woodward Avenue (PM peak hour only at LOS E)

The remaining study intersections are projected to operate at acceptable levels of service under Cumulative With Project Conditions.

INTERSECTION IMPACT CRITERIA

Signalized Intersections

For this analysis, traffic impacts at signalized intersections are defined to occur when the addition of project traffic causes:

- 1) intersection operations to deteriorate from an acceptable level (LOS D or better) under Cumulative No Conditions to an unacceptable level (LOS E or F); or
- 2) exacerbation of unacceptable operations at study intersections by increasing the volume-to-capacity (V/C) ratio by 0.01 or more at an intersection operating at LOS E or F under Cumulative No Conditions.

Based on the project impact criteria listed above, the proposed project will *cause a significant impact* at the Airport Way/State Route 120 Eastbound Ramps intersection during the PM peak hour.

Unsignalized Intersections

A significant impact at an unsignalized intersection is defined to occur when:

- 1) the addition of project traffic causes intersection operations to deteriorate from an acceptable level (LOS D or better) under Cumulative No Project Conditions to an unacceptable level (LOS E or F) under Cumulative Plus Project Conditions and the turning movement volumes exceed the peak-hour traffic signal warrant criteria from the 2003 *Manual on Uniform Traffic Control Devices*.
- 2) the addition of project traffic exacerbates unacceptable operations (LOS E or F) under Cumulative No Project Conditions and the turning movement volumes exceed the peak-hour traffic volume signal warrant criteria from the 2003 *Manual on Uniform Traffic Control Devices*.

**TABLE 16
CUMULATIVE NO PROJECT INTERSECTION LEVELS OF SERVICE**

Intersection	Peak Hour ¹	Intersection Control	Delay ²	LOS ³
1. Airport Way and West Yosemite Avenue	AM PM	Signal	20.7 35.5	C D
2. Airport Way and Wawona Street	AM PM	Signal	10.4 8.8	B A
3. Airport Way and Daniels Street	AM PM	Signal	20.8 24.5	C C
4. Airport Way and State Route 120 Westbound Ramps	AM PM	Signal	27.3 28.8	C C
5. Airport Way and State Route 120 Eastbound Ramps	AM PM	Signal	17.8 36.9	B D
6. Airport Way and Atherton Drive	AM PM	Signal	19.2 19.6	B B
7. Airport Way and Woodward Avenue	AM PM	All-Way Stop Controlled	10.3 11.6	B B
8. Airport Way and Peach Avenue	AM PM	Side Street Controlled Stop Sign	0.2 (8.7) 1.9 (12.0)	A (A) A (B)
9. Woodward Avenue and Oleander Road	AM PM	Side Street Controlled Stop Sign	1.0 (9.3) 1.9 (12.0)	A (A) A (B)
10. Peach Avenue and Oleander Road	AM PM	Side Street Controlled Stop Sign	7.3 (9.1) 9.2 (9.2)	A (A) A (A)
11. Union Road and West Yosemite Avenue	AM PM	Signal	28.2 42.1	C D
12. Union Road and Wawona Street	AM PM	Signal	34.1 33.3	C C
13. Union Road and Daniels Street	AM PM	Signal	14.4 17.4	B B
14. Union Road and State Route 120 Westbound Ramps	AM PM	Signal	18.0 33.4	B C
15. Union Road and State Route 120 Eastbound Ramps	AM PM	Signal	15.3 16.9	B B
16. Union Road and Atherton Drive	AM PM	Signal	14.1 22.0	B C
17. Union Road and Woodward Avenue	AM PM	All-Way Stop Controlled	9.0 10.7	A B
18. Union Road and Peach Avenue	AM PM	Side Street Controlled Stop Sign	0.5 (12.4) 0.3 (11.3)	A (B) A (B)
19. Woodward Avenue and Moffat Boulevard	AM PM	Side Street Controlled Stop Sign	4.8 (13.8) 7.8 (18.6)	A (B) A (C)

TABLE 16 (CONTINUED)
CUMULATIVE NO PROJECT INTERSECTION LEVELS OF SERVICE

Intersection	Peak Hour ¹	Intersection Control	Delay ²	LOS ³
20. State Route 99 Southbound Ramp and Moffat Boulevard	AM PM	Side Street Controlled Stop Sign	2.0 (11.5) 1.3 (13.5)	A (B) A (B)
21. Moffat Boulevard and Austin Road	AM PM	Signal	11.4 11.7	B B
22. State Route 99 Northbound Ramps and Austin Road	AM PM	All-Way Stop Controlled	10.4 9.9	B A
Notes: 1 AM = morning peak hour, PM = evening peak hour. 2 Whole intersection weighted average control delay expressed in seconds per vehicle using methodology described in the 2000 HCM. For side street stop controlled intersections, total control delay for the worst movement is presented in parentheses. 3 LOS = Level of service. For side street stop controlled intersections, LOS for the worst movement is shown in parentheses. LOS calculations conducted using the TRAFFIX level of service analysis software package.				

**TABLE 17
CUMULATIVE WITH PROJECT INTERSECTION LEVELS OF SERVICE**

Intersection	Peak Hour ¹	Cumulative No Project		Cumulative With Project		Significant Impact
		Delay ²	LOS ³	Delay ²	LOS ³	
1. Airport Way and West Yosemite Avenue	AM	20.7	C	20.7	C	No
	PM	35.5	D	35.8	D	No
2. Airport Way and Wawona Street	AM	10.4	B	10.4	B	No
	PM	8.8	A	9.0	A	No
3. Airport Way and Daniels Street	AM	20.8	C	21.0	C	No
	PM	24.5	C	25.0	C	No
4. Airport Way and State Route 120 Westbound Ramps	AM	27.3	C	41.1	D	No
	PM	28.8	C	40.8	D	No
5. Airport Way and State Route 120 Eastbound Ramps	AM	17.8	B	28.4	C	No
	PM	36.9	D	91.5	F	Yes
6. Airport Way and Atherton Drive	AM	19.2	B	21.1	C	No
	PM	19.6	B	20.3	C	No
7. Airport Way and Woodward Avenue	AM	10.3	B	11.7	B	No
	PM	11.6	B	21.5	C	No
8. Airport Way and Peach Avenue	AM	0.2 (8.7)	A (A)	0.5 (8.8)	A (A)	No
	PM	1.3 (9.9)	A (A)	1.4 (9.9)	A (A)	No
9. Woodward Avenue and Oleander Road	AM	1.0 (9.3)	A (A)	7.7 (15.2)	A (C)	No
	PM	1.9 (12.0)	A (B)	12.2 (47.9)	B (E)	Yes
10. Peach Avenue and Oleander Road	AM	7.3 (9.1)	A (A)	6.4 (9.1)	A (A)	No
	PM	9.2 (9.2)	A (A)	8.7 (9.2)	A (A)	No
11. Union Road and West Yosemite Avenue	AM	28.2	C	28.3	C	No
	PM	42.1	D	43.0	D	No
12. Union Road and Wawona Street	AM	34.1	C	34.8	C	No
	PM	33.3	C	37.4	D	No
13. Union Road and Daniels Street	AM	14.4	B	14.5	B	No
	PM	17.4	B	18.0	B	No
14. Union Road and State Route 120 Westbound Ramps	AM	18.0	B	23.6	C	No
	PM	33.4	C	45.5	D	No
15. Union Road and State Route 120 Eastbound Ramps	AM	15.3	B	17.4	B	No
	PM	44.4	D	53.3	D	No
16. Union Road and Atherton Drive	AM	14.1	B	22.1	C	No
	PM	15.0	B	28.1	C	No
17. Union Road and Woodward Avenue	AM	9.0	A	13.7	B	No
	PM	10.7	B	41.7	E	Yes
18. Union Road and Peach Avenue	AM	0.5 (12.4)	A (B)	0.5 (12.4)	A (B)	No
	PM	0.3 (11.3)	A (B)	0.3 (11.3)	A(B)	No

TABLE 17 (CONTINUED)
CUMULATIVE WITH PROJECT INTERSECTION LEVELS OF SERVICE

Intersection	Peak Hour ¹	Cumulative No Project		Cumulative With Project		Significant Impact
		Delay ²	LOS ³	Delay ²	LOS ³	
19. Woodward Avenue and Moffat Boulevard	AM	4.8 (13.8)	A (B)	4.9 (13.8)	A (B)	No
	PM	7.8 (18.6)	A (C)	8.2 (19.3)	A (C)	No
20. State Route 99 Southbound Ramp and Moffat Boulevard	AM	2.0 (11.5)	A (B)	2.0 (11.6)	A (B)	No
	PM	1.3 (13.5)	A (B)	1.3 (13.8)	A (B)	No
21. Moffat Boulevard and Austin Road	AM	11.4	B	11.6	B	No
	PM	15.2	B	15.6	B	No
22. State Route 99 Northbound Ramps and Austin Road	AM	10.4	B	10.5	B	No
	PM	9.9	A	10.1	B	No

Notes:

- 1 AM = morning peak hour, PM = evening peak hour.
- 2 Whole intersection weighted average control delay expressed in seconds per vehicle using methodology described in the 2000 HCM. For side street stop controlled intersections, total control delay for the worst movement is presented in parentheses.
- 3 LOS = Level of service. For side street stop controlled intersections, LOS for the worst movement is shown in parentheses. LOS calculations conducted using the TRAFFIX level of service analysis software package.

3) at freeway intersections the off-ramp queue length increases by 5 or more vehicles.

Based on the project impact criteria listed above, the proposed project will cause a **significant impact** at the Union Road/Woodward Avenue and Woodward Avenue/Oleander Road study intersections during the PM peak hour.

INTERSECTION MITIGATION MEASURES

The Airport Way/State Route 120 Eastbound Ramps intersection is projected to be significantly impacted by the proposed project. Providing a shared left-turn/through lane and a separate right-turn lane on the eastbound approach would result in 37.2 seconds of delay (LOS D) under Cumulative With Project Conditions during the PM peak hour. The proposed project is responsible for funding the entire cost of these improvements.

Providing a separate left-turn lane and a shared right-turn/through lane on the southbound approach of the intersection of Union Road and Woodward Avenue would result in LOS C operations with 22.3 seconds of delay. This improvement would mitigate the project's cumulative impact. Figure 12 presents the proposed mitigation measures.

Providing an all-way stop control at the Woodward Avenue/Oleander Road intersection would provide LOS B (14.4 seconds of average control delay) during the PM peak hour under Cumulative With Project Conditions. This improvement would mitigate the project's cumulative impact.

ROADWAY SEGMENT LEVELS OF SERVICE

The results of the LOS analysis for Cumulative roadway conditions are presented in Table 18. The LOS calculations indicate that 4 of the 5 study roadways are projected to operate at unacceptable levels of service under Cumulative With Project Conditions. The roadway segment of Airport Way south of State Route 120 is projected to degrade from an acceptable level of service (LOS D) to an unacceptable level of service (LOS F) under Cumulative With Project Conditions.

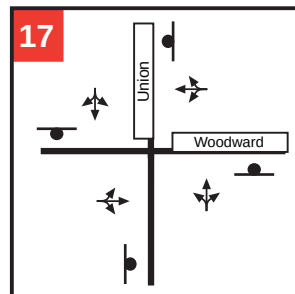
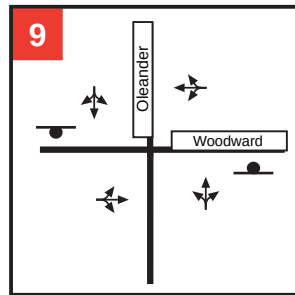
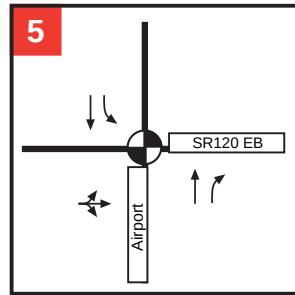
TABLE 18 CUMULATIVE ROADWAY LEVELS OF SERVICE					
Roadway Segment	Lanes	No Project		With Project	
		Volume ¹	LOS ²	Volume ¹	LOS ²
1. Airport Way, North of State Route 120	2	24,065	F	24,480	F
2. Airport Way, South of State Route 120	2	13,710	D	17,700	F
3. Union Road, North of State Route 120	2	20,755	F	21,245	F
4. Union Road, South of State Route 120	2	26,830	F	34,170	F
5. Woodward Avenue, East of Union Road	2	5,430	C	6,015	C
Note:					
1 Average daily traffic.					
2 LOS = Level of service.					

As development occurs in Manteca, right-of-way will be dedicated to widening designated roadways throughout the city. The study roadway segments are projected to be widened according to the Manteca General Plan. If this development occurs by 2010, then the following roadway widenings are expected:

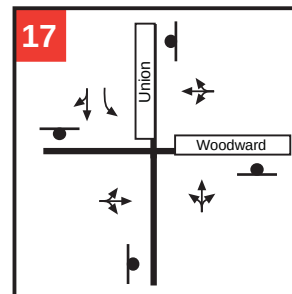
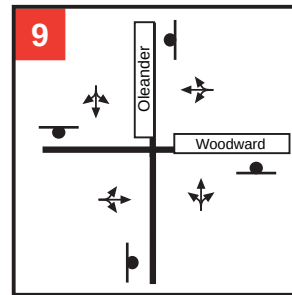
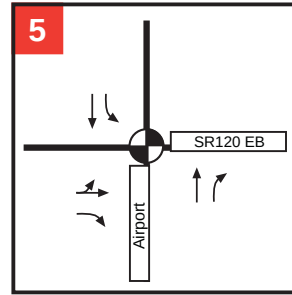
Airport Way, between Daniels Street and Atherton Drive widened from two to four lanes
 Union Road, between Daniels Street and State Route 120 widened from two to four lanes
 Union Road, between State Route 120 and Atherton Drive widened from two to four lanes

Table 18 presents the levels of service for Airport Way and Union Road assuming they are widened as described above under 2010 conditions. The roadway segment of Union Road south of State Route 120 is projected to operate at an unacceptable level of service (LOS E) with the addition of project-generated traffic under Cumulative Plus With Conditions. All of the remaining study roadway segments would operate at acceptable levels of service under Cumulative No Project and Cumulative With Project Conditions.

Cumulative Geometry



Cumulative Geometry
with Mitigation



LEGEND:



= Traffic Signal



= Stop Sign



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TRANSPORTATION CONSULTANTS

February 2006
SJ05-826

Oleander Estates and Sundance Residential

CUMULATIVE MITIGATION MEASURES

FIGURE 12

**TABLE 19
CUMULATIVE ROADWAY LEVELS OF SERVICE**

Roadway Segment	Lanes	No Project		With Project	
		Volume ¹	LOS ²	Volume ¹	LOS ²
1. Airport Way, North of State Route 120	4	24,065	D	24,480	D
2. Airport Way, South of State Route 120	4	13,710	C	17,700	C
3. Union Road, North of State Route 120	4	20,755	C	21,245	C
4. Union Road, South of State Route 120	4	26,830	D	34,170	E
5. Woodward Avenue, East of Union Road	2	5,430	C	6,015	C
Note:					
1 Average daily traffic.					
2 LOS = Level of service.					

CUMULATIVE ROADWAY SEGMENT IMPACT CRITERIA

A significant impact on a roadway segment is defined to occur when:

- 1) the addition of project traffic causes roadway operations to deteriorate from an acceptable level (LOS D or better) under Cumulative No Project Conditions to an unacceptable level (LOS E or F) under Cumulative With Project Conditions or
- 2) exacerbation of unacceptable operations (LOS E or F) at roadway segments by increasing the volume by one percent (1%) between Cumulative No Project and Cumulative With Project

Based on the criteria listed above, the proposed project would **have a significant impact** at the following study roadway segments:

Airport Way north of State Route 120
Airport Way south of State Route 120
Union Road north of State Route 120
Union Road south of State Route 120

If the roadway widenings described above in Table 19 occur between now and 2010 then the study roadway segment of Union Road south of State Route 120 would **have a significant impact**.

ROADWAY MITIGATION MEASURES

Based on the level of service threshold established in the City of Manteca General Plan, all the roadway segment impacts would be mitigated with the following roadway widening:

Airport Way north of State Route 120, widen from 2 to 4 lanes
Airport Way south of State Route 120, widen from 2 to 4 lanes
Union Road north of State Route 120, widen from 2 to 4 lanes
Union Road south of State Route 120, widen from 2 to 6 lanes

The City of Manteca General Plan identifies the widening of Airport Way between the State Route 120 Westbound Ramps and Woodward Road to 8 lanes, south of Woodward Road to 6 lanes, and north of the State Route 120 Westbound ramps intersection to 6 lanes under 2025 Conditions. We recommend the widening of Airport Way to four lanes to mitigate the impact of the proposed project on Airport Way. The payment of traffic fees would be directed to funding this improvement.

The Union Road cumulative impact would be mitigated by widening Union Road to six lanes south of State Route 120 and 4 lanes to the north of State Route 120. The City of Manteca General Plan identifies the widening of Union Road to 6 lanes between Yosemite Avenue and Atherton Way under 2025 Conditions. We recommend the widening of Union Road to four lanes to the north of State Route 120 and 6 lanes to the south of State Route 120 to mitigate the impact of the proposed project on Union Road. The payment of traffic fees would be directed to funding this improvement.

If the roadway widenings described in Table 18 occur between now and 2010 then the study roadway segment of Union Road south of State Route 120 would be mitigated with widening Union Road to 6 lanes. The City of Manteca General Plan identifies the widening of Union Road to 6 lanes between Yosemite Avenue and Atherton Way under 2025 Conditions. The payment of traffic fees would be directed to funding this improvement.

FREEWAY OPERATIONS

The operations of the freeway facilities were analyzed under Cumulative Conditions following the same procedures outlined under Project Conditions. The results are presented in Tables 19 and 20. The level of service analysis shows that the three westbound study mainline segments and four westbound study ramps are projected to operate unacceptably (LOS F) under Cumulative No Project Conditions during the AM peak hour.

With the addition of project generated traffic, the mainline segment of eastbound State Route 120 between Yosemite Avenue and Airport Way during the PM peak hour is projected to degrade to an unacceptable level of service (LOS E). During the AM peak hour the westbound mainline segments are projected to continue operating at LOS F. The westbound mainline segments are projected to degrade to LOS D during the PM peak hour. However, this is still considered an acceptable level of service.

The merge/diverge analysis shows that with the addition of project-generated traffic, the levels of service are expected to remain the same except on the eastbound Airport Way off-ramp during the PM peak hour. This off-ramp is expected to degrade from LOS C under Cumulative No Project Conditions to LOS D under Cumulative With Project Conditions. LOS D is considered an acceptable level of service for the freeway facilities.

CUMULATIVE FREEWAY IMPACT CRITERIA

A significant impact on a freeway mainline segment or ramp is defined to occur when the addition of project traffic causes roadway operations to deteriorate from an acceptable level (LOS D or better) under Cumulative No Project Conditions to an unacceptable level (LOS E or F) under Cumulative With Project Conditions, or the project adds traffic to freeways segments already operating at unacceptable levels of service (LOS E or F) under Cumulative Conditions.

Based on the criteria listed above, the proposed project will cause a significant impact at the following freeway facilities:

Eastbound SR 120, Airport Way to Yosemite Avenue (PM peak hour)

Westbound SR 120, Main Street to Yosemite Avenue (three segments during the AM peak hour)
Westbound SR 120 Merge and Diverge ramps at Union Road (AM peak hour)
Westbound SR 120 Merge and Diverge ramps at Airport Way (AM peak hour)

FREEWAY OPERATIONS MITIGATION MEASURES

It should be noted that the freeway mainline level of service on eastbound SR 120 between Airport Way and Yosemite Avenue is currently LOS D- under Existing Conditions during the PM peak hour. Buildout of the project would occur over the next several years, during which time regional traffic growth on SR 120 would result in the freeway mainline degrading to LOS E/F Conditions before the Proposed Project is fully occupied.

The widening of SR 120 from four to six lanes is identified by SJCOG Regional Transportation Plan as a Tier 1 improvement, but is currently not funded for design and construction. Therefore, for the purpose of this Environmental Impact Report, these impacts would be considered **significant and unavoidable** under Cumulative With Project Conditions.

TABLE 20
CUMULATIVE STATE ROUTE 120 MAINLINE LEVELS OF SERVICE

Travel Direction	Segment	Peak Hour	Cumulative No Project		Cumulative With Project		Significant Impact
			Density ¹	LOS ²	Density ¹	LOS ²	
Eastbound	Yosemite to Airport	AM	17.9	B	19.2	C	No
		PM	32.6	D	37.2	E	Yes
	Airport to Union	AM	18.7	C	19.2	C	No
		PM	30.2	D	31.7	D	No
	Union to Main	AM	18.2	C	20.3	C	No
		PM	27.3	D	29.0	D	No
Westbound	Main to Union	AM	>45	F	>45	F	Yes
		PM	25.2	C	27.7	D	No
	Union to Airport	AM	>45	F	>45	F	Yes
		PM	25.5	C	26.4	D	No
	Airport to Yosemite	AM	>45	F	>45	F	Yes
		PM	24.1	C	26.3	D	No

Note:

- 1 Measured in vehicles per mile per lane.
- 2 LOS = Level of service.

**TABLE 21
CUMULATIVE STATE ROUTE 120 RAMP LEVELS OF SERVICE**

Travel Direction	Ramp	Merge/Diverge	Peak Hour	Cumulative No Project		Cumulative With Project		Significant Impact
				Density ¹	LOS ²	Density ¹	LOS ²	
Eastbound	Airport Way	Diverge (Off-ramp)	AM	13.1	B	14.4	B	No
			PM	27.5	C	30.8	D	No
		Merge (On-ramp)	AM	16.0	B	16.4	B	No
			PM	26.4	C	27.6	C	No
	Union Road	Diverge (Off-ramp)	AM	13.9	B	14.4	B	No
			PM	25.4	C	26.7	C	No
		Merge (On-ramp)	AM	15.5	B	17.3	B	No
			PM	23.7	C	25.2	C	No
Westbound	Union Road	Diverge (Off-ramp)	AM	47.8	F	48.7	F	Yes
			PM	20.4	C	22.9	C	No
		Merge (On-ramp)	AM	47.3	F	48.3	F	Yes
			PM	22.1	C	22.8	C	No
	Airport Way	Diverge (Off-ramp)	AM	48.6	F	49.7	F	Yes
			PM	20.7	C	21.6	C	No
		Merge (On-ramp)	AM	46.7	F	49.3	F	Yes
			PM	20.9	C	22.8	C	No

Note:

- 1 Measured in vehicles per mile per lane.
- 2 LOS = Level of service.

**APPENDIX A:
EXISTING INTERSECTION VOLUMES**

Traffic Data Service
(408) 377-2988
tdsbay@cs.com

File Name : 1AMFINAL
Site Code : 00000001
Start Date : 01/05/2006
Page No : 1

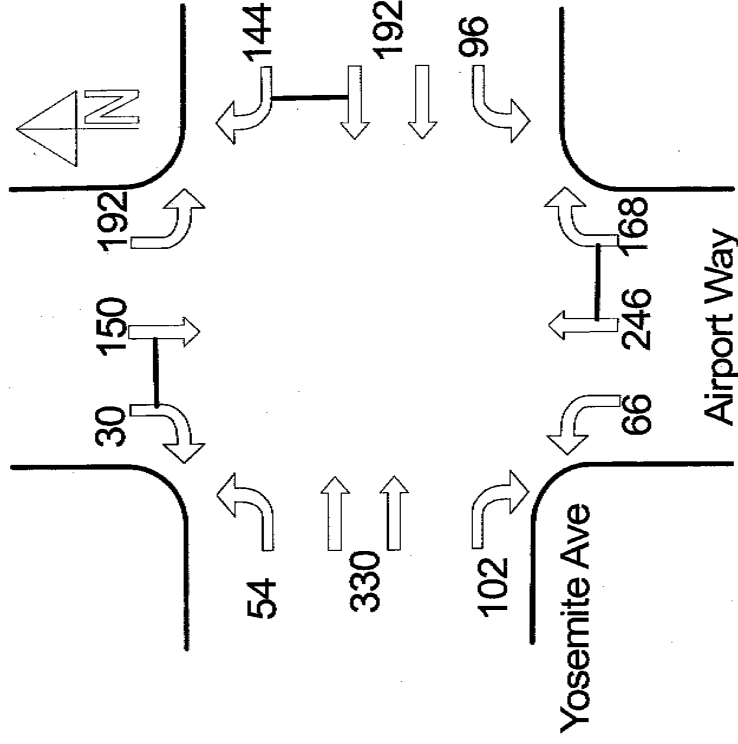
Groups Printed: 1 - Unsplit																							
AIRPORT WY Southbound					YOSEMITE AVE Westbound					AIRPORT WY Northbound					YOSEMITE AVE Eastbound								
Start Time	Rig	Thr	Left	Ped	App.	Rig	Thr	Left	Ped	App.	Rig	Thr	Left	Ped	App.	Rig	Thr	Left	Ped	Int.	Total		
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0				
07:00 AM	4	40	14	0	58	15	34	14	0	63	23	22	23	0	68	9	21	0	0	30	219		
07:15 AM	7	61	17	0	85	11	47	38	0	96	17	25	12	0	54	9	28	1	0	38	273		
07:30 AM	10	56	16	0	82	22	50	21	0	93	21	29	24	0	74	7	22	4	0	33	282		
07:45 AM	9	48	17	0	74	28	27	17	0	72	28	44	30	0	102	3	37	4	0	44	292		
Total	30	205	64	0	299	76	158	90	0	324	89	120	89	0	298	28	108	9	0	145	1066		
08:00 AM	6	56	24	0	86	30	38	23	0	91	38	34	12	0	84	5	28	2	0	35	296		
08:15 AM	5	36	22	0	63	17	29	23	0	69	27	25	14	0	66	6	28	3	0	37	235		
08:30 AM	5	39	26	0	70	23	29	19	0	71	30	19	11	0	60	12	29	1	0	42	243		
08:45 AM	6	34	21	0	61	13	36	19	0	68	34	28	6	0	68	4	35	0	0	39	236		
Total	22	165	93	0	280	83	132	84	0	299	129	106	43	0	278	27	120	6	0	153	1010		
Grand Total	52	370	157	0	579	159	290	174	0	623	218	226	132	0	576	55	228	15	0	298	2076		
Approach %	9.0	63.	27.	0.0	25.	46.	27.	0.0	37.	39.	22.	0.0	8	2	9	5	76.	5.0	0.0				
Total %	2.5	17.	7.6	0.0	27.9	7.7	0	14.	8.4	0.0	30.0	5	9	10.	10.	6.4	0.0	27.7	2.6	11.	0.7	0.0	14.4

	AIRPORT WY Southbound					YOSEMITE AVE Westbound					AIRPORT WY Northbound					YOSEMITE AVE Eastbound						
	Start Time	Rig	Thr	Left	Ped	Rig	Thr	Left	Ped	App.	Rig	Thr	Left	Ped	App.	Rig	Thr	Left	Ped	App.	Int. Total	
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																						
Intersect																						
on																						
Volume		32	221	74	0	327	91	162	99	0	352	104	132	78	0	314	24	115	11	0	150	1143
Percent		9.8	67	22	0.0	25.46	25.46	28.0	0.0	9.0	1.0	33.42	33.42	24.0	0.0	1.0	16.76	7.3	0.0	0		
08:00 Volume		6	56	24	0	86	30	38	23	0	91	38	34	12	0	84	5	28	2	0	35	296
Peak Factor																					0.965	
High Int. Factor	08:00 AM	6	56	24	0	86	07:15 AM	11	47	38	0	96	07:45 AM	3	37	4	0	44				
Volume																					0.85	
Peak Factor																					2	

Date: 6/2/05

Intersection: Yosemite Ave / Airport WY

Observer: GRM



Groups Printed - Unfilled											
AIRPORT WY				PEACH AVE				AIRPORT WY			
Southbound				Westbound				Northbound			
Start Time	Rig	Thr	Ped	Rig	Thr	Ped	Rig	Thr	Ped	Rig	Thr
Factor	ht	1.0	1.0	ht	1.0	1.0	ht	1.0	1.0	ht	1.0
07:00 AM	0	9	0	0	2	0	0	11	0	0	0
07:15 AM	0	12	0	0	1	0	0	20	0	0	0
07:30 AM	0	16	1	0	2	0	0	16	0	0	0
07:45 AM	0	21	0	0	2	0	0	21	0	0	0
Total	0	58	1	0	59	0	0	70	0	0	0
08:00 AM	0	14	0	0	1	0	0	25	0	0	0
08:15 AM	0	17	1	0	0	0	0	16	0	0	0
08:30 AM	0	8	1	0	9	0	0	0	18	0	0
08:45 AM	0	13	1	0	14	2	0	0	21	0	0
Total	0	52	3	0	55	3	0	70	0	0	0
Grand Total	0	110	4	0	114	9	0	149	0	0	0
Apprch %	0	96	3.5	0.0	100	0.0	0.0	99	0.0	0.0	0.0
Total %	0	40	1.5	0.0	41.8	3.3	0.0	54	0.0	0.0	0.0

	AIRPORT WY Southbound						PEACH AVE Westbound						AIRPORT WY Northbound						Eastbound					
Start Time	Rig ht	Left	Ped	App Total	Trr ht	U Left	Rig ht	Left	Ped	App Total	Trr ht	U Left	Rig ht	Left	Ped	App Total	Trr ht	U Left	Rig ht	Left	Ped	App Total		
Peak Hour from 07:00 AM to 08:45 AM - Peak 1 of 1																								
Intersect:																								
on																								
Volume	0	68	2	0	70	4	0	0	0	4	0	80	0	0	0	80	0	0	0	0	0	154		
Percent	97	2.9	0.0			100	0.0	0.0	0.0		0.0	100	0.0	0.0	0.0		0.0	0.0	0.0	0.0				
Volume	0	21	0	0	21	2	0	0	0	2	0	21	0	0	0	21	0	0	0	0	0	44		
Peak Factor																								
High Int. Volume	0	21	0	0	21	0.83	07:45 AM 2 0 0 0 2						08:00 AM 0 25 0 0 25						6:45:00 AM 0.50 0.80 0					
Peak Factor																								
	0.875																							

Groups Printed-Unfilled																			
AIRPORT WY Southbound					PEACH AVE Westbound					AIRPORT WY Northbound					Eastbound				
Start Time	Rig	Thr	Ped	App.	Rig	Thr	Ped	App.	Rig	Thr	Ped	App.	Rig	Thr	Ped	App.			
Factor	ht	u	Left	Total	ht	u	Left	Total	ht	u	Left	Total	ht	u	Left	Total			
04:00 PM	0	34	3	37	2	0	0	2	0	26	0	26	0	0	0	0			
04:15 PM	0	31	2	33	1	0	0	1	1	22	0	23	0	0	0	0			
04:30 PM	0	32	5	37	5	0	0	5	1	14	0	15	0	0	0	0			
04:45 PM	0	36	2	38	0	0	0	2	0	26	0	26	0	0	0	0			
Total	0	143	12	155	10	0	1	11	2	108	0	110	0	0	0	276			
05:00 PM	0	31	3	34	1	0	1	0	0	26	0	26	0	0	0	0			
05:15 PM	0	37	4	41	3	0	0	3	0	28	0	28	0	0	0	0			
05:30 PM	0	34	1	35	2	0	1	3	0	23	0	23	0	0	0	0			
05:45 PM	0	29	2	31	4	0	1	5	0	24	0	24	0	0	0	0			
Total	0	131	10	141	10	0	3	13	0	101	0	101	0	0	0	255			
Grand Total	0	274	22	0	296	20	0	4	0	24	2	209	0	0	0	531			
Apprch %	0.0	92	7.4	0.0	83.0	0.0	16.0	0.0	0.9	99.1	0.0	0.0	0.0	0.0	0.0	0.0			
Total %	0.0	51	4.1	0.0	55.7	3.8	0.0	0.8	0.0	4.5	0.4	39.7	0.0	0.0	0.0	0.0			

	AIRPORT WY Southbound						PEACH AVE Westbound						AIRPORT WY Northbound						Eastbound					
Start Time	Rtg	Thru	Ped	App.	Total		Rtg	Thru	Ped	App.	Total		Rtg	Thru	Ped	App.	Total		Rtg	Thru	Ped	App.	Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																								
Intersect:																								
on																								
Volume	0	146	14	0	160		11	0	2	0	13		1	114	0	0	115		0	0	0	0	288	
Percent	0.0	91.	8.8	0.0			84.	0	15.	0.0			0.9	99.	0.0	0.0			0.0	0.0	0.0	0.0		
04:30							6		4															
Volume	0	42	5	0	47		5	0	1	0	6		1	34	0	0	35		0	0	0	0	88	
Peak Factor																							0.818	
High Int. Volume	0	42	5	0	47		04:30 PM						04:30 PM						3:45:00 PM					
Peak Factor							0.85				6		1	34	0	0	35							
							1				2						0.82						1	

Groups Printed- Unshifted											
OLEANDER AVE Southbound						PEACH AVE Westbound					
Start Time	Rig	Thr	Left	Ped	App. Total	Rig	Thr	Left	Ped	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
07:00 AM	0	0	0	0	0	0	1	0	0	1	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	1	0	2	0	1	0	0	1	4
08:00 AM	0	0	0	0	0	1	2	0	0	3	0
08:15 AM	0	1	0	0	1	0	0	0	0	0	0
08:30 AM	0	1	0	0	1	0	0	0	0	0	0
08:45 AM	0	1	0	0	1	0	0	0	0	0	0
Total	0	2	0	0	2	0	2	1	0	3	13
Grand Total	1	2	1	0	4	0	3	1	0	4	6
Approch %	25	50	25	0.0	0.0	75	25	0.0	0.0	0.0	0.0
Total %	3.8	7.7	3.8	0.0	15.4	0.0	11.1	3.8	0.0	15.4	23.1

Groups Printed- Unshifted											
OLEANDER AVE Southbound						PEACH AVE Westbound					
Start Time	Rig	Thr	Left	Ped	App. Total	Rig	Thr	Left	Ped	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
07:00 AM	0	0	0	0	0	0	1	0	0	1	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0
08:00 AM	0	1	0	0	1	2	5	1	0	8	0
08:15 AM	0	1	0	0	1	25	62	12	0	100	0
08:30 AM	0	0	0	0	0	0	5	0	0	5	0
08:45 AM	0	0	0	0	0	1	2	0	0	3	0
Total	0	2	0	0	2	27	79	13	0	116	0
Grand Total	0	2	0	0	2	27	79	13	0	116	0
Approch %	0.0	0.0	0.0	0.0	0.0	100	100	0.0	0.0	0.0	0.0
Total %	0.0	0.0	0.0	0.0	0.0	100	100	0.0	0.0	0.0	0.0

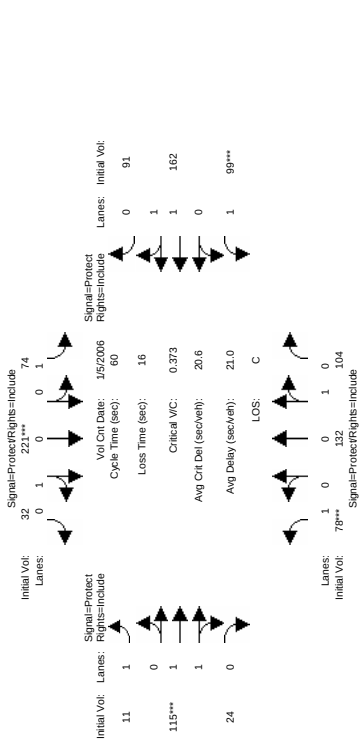
Groups Printed- Unshifted											
OLEANDER AVE Southbound						PEACH AVE Westbound					
Start Time	Rig	Thr	Left	Ped	App. Total	Rig	Thr	Left	Ped	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
04:00 PM	0	1	0	0	1	0	1	0	0	1	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	1	0	0	0	1	0	4	0	0	4	0
04:45 PM	1	0	0	0	1	0	1	0	0	1	0
Total	2	1	0	0	3	0	6	0	0	6	0
05:00 PM	0	0	0	0	0	1	1	0	0	2	0
05:15 PM	0	0	0	0	0	0	2	0	0	2	0
05:30 PM	0	0	0	0	0	1	2	0	0	3	0
05:45 PM	1	0	0	0	1	0	3	0	0	3	0
Total	1	1	0	0	2	2	8	0	0	10	0
Grand Total	3	2	0	0	5	2	14	0	0	16	0
Approch %	60	40	0.0	0.0	0.0	12	87	0.0	0.0	22	77
Total %	5.6	3.7	0.0	0.0	9.3	3.7	25	0.0	0.0	29.6	13

Groups Printed- Unshifted											
OLEANDER AVE Southbound						PEACH AVE Westbound					
Start Time	Rig	Thr	Left	Ped	App. Total	Rig	Thr	Left	Ped	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
04:00 PM	0	1	0	0	1	0	1	0	0	1	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	1	0	0	0	1	0	4	0	0	4	0
04:45 PM	1	0	0	0	1	0	1	0	0	1	0
Total	2	1	0	0	3	0	6	0	0	6	0
05:00 PM	0	0	0	0	0	1	1	0	0	2	0
05:15 PM	0	0	0	0	0	0	2	0	0	2	0
05:30 PM	0	0	0	0	0	1	2	0	0	3	0
05:45 PM	1	0	0	0	1	0	3	0	0	3	0
Total	1	1	0	0	2	2	8	0	0	10	0
Grand Total	3	2	0	0	5	2	14	0	0	16	0
Approch %	60	40	0.0	0.0	0.0	12	87	0.0	0.0	22	77
Total %	5.6	3.7	0.0	0.0	9.3	3.7	25	0.0	0.0	29.6	13

APPENDIX B:
INTERSECTION LEVEL OF SERVICE CALCULATIONS

EXISTING AND PROJECT CONDITIONS

Intersection #1: Airport/Yosemite

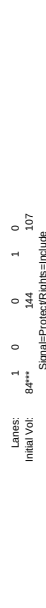
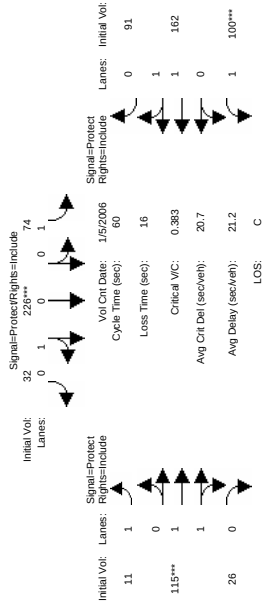


Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Min. Green:	7 10 10	7 10 10	7 10 10	7 10 10
Volume Module: >> Count Date: 5 Jan 2006 << 7:15-8:15AM				
Base Vol:	78 132 104	74 221 32	11 115 24	99 162 91
Growth Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Initial Bse:	78 132 104	74 221 32	11 115 24	99 162 91
Added Vol:	0 0 0	0 0 0	0 0 0	0 0 0
PasserByVol:	0 0 0	0 0 0	0 0 0	0 0 0
Initial Fut:	78 132 104	74 221 32	11 115 24	99 162 91
User Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Volume:	78 132 104	74 221 32	11 115 24	99 162 91
Reduced Vol:	0 0 0	0 0 0	0 0 0	0 0 0
PCE Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
MLF Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Final Vol:	78 132 104	74 221 32	11 115 24	99 162 91

Saturation Flow Module:	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900
Sat/Lane:	0.95 0.93 0.93	0.95 0.98 0.98	0.95 0.93 0.93	0.95 0.90 0.90
Adjustment:	1.00 0.56 0.44	1.00 0.87 0.13	1.00 1.65 0.35	1.00 1.28 0.72
Lanes:	1805 993	782 1805 1628	236 1805 2909	607 1805 2187 1228
Final Sat:	1805 993	782 1805 1628	236 1805 2909	607 1805 2187 1228

Capacity Analysis Module:	0.04 0.13 0.13	0.04 0.14 0.14	0.01 0.04 0.04	0.05 0.07 0.07
Vol/Sat:	0.04 0.13 0.13	0.04 0.14 0.14	0.01 0.04 0.04	0.05 0.07 0.07
Crit Moves:	7 0 15.4 15.4	10.8 19.2 19.2	7.3 10.0 10.0	7.8 10.5 10.5
Green Time:	0.37 0.52 0.52	0.23 0.42 0.42	0.05 0.24 0.24	0.42 0.43 0.43
Volume/Cap:	24.5 19.1 19.1	21.0 16.0 16.0	23.3 21.7 21.7	24.1 22.1 22.1
Uniform Del:	1.1 1.0 1.0	0.4 0.5 0.5	0.1 0.2 0.2	1.2 0.5 0.5
Increment Del:	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0
InitQueueDel:	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0
Delay Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Delay/Veh:	25.6 20.1 20.1	21.4 16.5 16.5	23.4 21.9 21.9	25.3 22.6 22.6
User DelAdj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
AdjDel/Veh:	25.6 20.1 20.1	21.4 16.5 16.5	23.4 21.9 21.9	25.3 22.6 22.6
HCN2kAvg:	2 4 4	1 4 4	0 1 1	2 2 2

Intersection #1: Airport/Yosemite



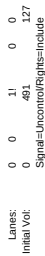
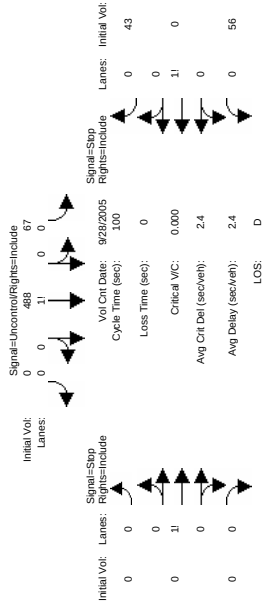
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Min. Green:	7 10 10	7 10 10	7 10 10	7 10 10
Volume Module: >> Count Date: 5 Jan 2006 << 7:15-8:15AM				
Base Vol:	78 132 104	74 221 32	11 115 24	99 162 91
Growth Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Initial Bse:	78 132 104	74 221 32	11 115 24	99 162 91
Added Vol:	0 0 0	0 0 0	0 0 0	0 0 0
PasserByVol:	0 0 0	0 0 0	0 0 0	0 0 0
Initial Fut:	78 132 104	74 221 32	11 115 24	99 162 91
User Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Volume:	78 132 104	74 221 32	11 115 24	99 162 91
Reduced Vol:	0 0 0	0 0 0	0 0 0	0 0 0
PCE Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
MLF Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Final Vol:	78 132 104	74 221 32	11 115 24	99 162 91

Saturation Flow Module:	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900
Sat/Lane:	0.95 0.94 0.94	0.95 0.98 0.98	0.95 0.92 0.92	0.95 0.90 0.90
Adjustment:	1.00 0.57 0.43	1.00 0.88 0.12	1.00 1.63 0.37	1.00 1.28 0.72
Lanes:	1805 1020 758	1805 1633 231	1805 2862 647	1805 2187 1228
Final Sat:	1805 1020 758	1805 1633 231	1805 2862 647	1805 2187 1228

Capacity Analysis Module:	0.05 0.14 0.14	0.04 0.14 0.14	0.01 0.04 0.04	0.06 0.07 0.07
Vol/Sat:	0.05 0.14 0.14	0.04 0.14 0.14	0.01 0.04 0.04	0.06 0.07 0.07
Crit Moves:	7 0 15.5 15.5	10.8 19.3 19.3	7.3 10.0 10.0	7.7 10.4 10.4
Green Time:	0.40 0.55 0.55	0.23 0.43 0.43	0.05 0.24 0.24	0.43 0.43 0.43
Volume/Cap:	24.6 19.2 19.2	21.0 16.0 16.0	23.3 21.7 21.7	24.1 22.1 22.1
Uniform Del:	1.2 1.4 1.4	0.4 0.5 0.5	0.1 0.2 0.2	1.3 0.5 0.5
Increment Del:	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0
InitQueueDel:	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0
Delay Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Delay/Veh:	25.8 20.6 20.6	21.4 16.5 16.5	23.4 21.9 21.9	25.4 22.6 22.6
User DelAdj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
AdjDel/Veh:	25.8 20.6 20.6	21.4 16.5 16.5	23.4 21.9 21.9	25.4 22.6 22.6
HCN2kAvg:	2 5 5	1 4 4	0 1 1	2 2 2

Level of Service Computer Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #2: Airport/Wawona



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

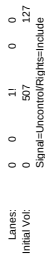
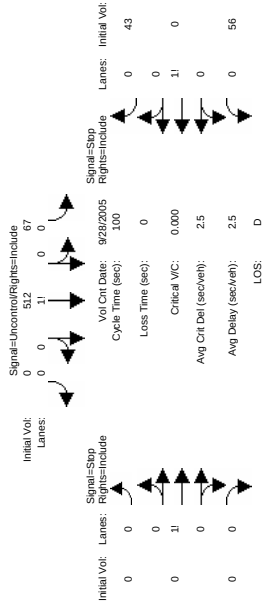
Volume Module: >> Count Date: 28 Sep 2005 <<
Base Vol: 0 491 127 67 488 0 0 0 0 0 56 0 43
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 491 127 67 488 0 0 0 0 0 56 0 43
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 491 127 67 488 0 0 0 0 0 56 0 43
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 0 491 127 67 488 0 0 0 0 0 56 0 43
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 0 491 127 67 488 0 0 0 0 0 56 0 43
Critical Gap Module:
Critical Gap:xxxxx xxx xxxxx 4.1 xxx xxxxx xxxxx xxx 6.4 xxx 6.2
FollowupPlm:xxxxx xxx xxxxx 2.2 xxx xxxxx xxxxx xxx 3.5 xxx 3.3

Capacity Module:
Conflict Vol: xxx xxxxx 618 xxx xxxxx xxx xxx 1177 xxx 555
Potential Cap.: xxx xxx xxxxx 972 xxx xxxxx xxx xxx 213 xxx 535
Move Cap.: xxx xxx xxxxx 972 xxx xxxxx xxx xxx 202 xxx 535
Volume/Cap: xxx xxx xxx 0.07 xxx xxx 0.28 xxx 0.08

Level of Service Module:
Queue: xxx xxx xxx 0.2 xxx xxx xxx xxx xxx xxx xxx
Stopped Del:xxxxx xxx xxx 9.0 xxx xxx xxx xxx xxx xxx xxx
LOS by Move: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Movement: xxx xxx xxx xxx 0.2 xxx xxx xxx xxx xxx 1.6 xxx
Shared Cap.: xxx xxx xxx xxx 9.0 xxx xxx xxx xxx xxx 25.1 xxx
Shrd StpDel:xxxxx xxx xxx A xxx xxx xxx xxx xxx 25.1 xxx
Shared LOS: xxx xxx xxx xxx xxx xxx xxx xxx xxx
ApproachDel: xxx xxx xxx xxx xxx xxx xxx xxx xxx
ApproachLOS: xxx xxx xxx xxx xxx xxx xxx xxx xxx

Level of Service Computer Report
2000 HCM Unsignalized (Future Volume Alternative)
Project PM

Intersection #2: Airport/Wawona



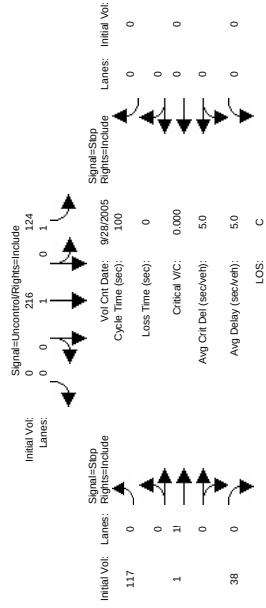
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module: >> Count Date: 28 Sep 2005 <<
Base Vol: 0 491 127 67 488 0 0 0 0 0 56 0 43
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 491 127 67 488 0 0 0 0 0 56 0 43
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 491 127 67 488 0 0 0 0 0 56 0 43
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 0 491 127 67 488 0 0 0 0 0 56 0 43
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 0 491 127 67 488 0 0 0 0 0 56 0 43
Critical Gap Module:
Critical Gap:xxxxx xxx xxxxx 4.1 xxx xxxxx xxxxx xxx 6.4 xxx 6.2
FollowupPlm:xxxxx xxx xxxxx 2.2 xxx xxxxx xxxxx xxx 3.5 xxx 3.3

Capacity Module:
Conflict Vol: xxx xxx xxx 634 xxx xxx xxx xxx xxx 1216 xxx 571
Potential Cap.: xxx xxx xxx 959 xxx xxx xxx xxx xxx 202 xxx 524
Move Cap.: xxx xxx xxx 959 xxx xxx xxx xxx xxx 191 xxx 524
Volume/Cap: xxx xxx xxx 0.07 xxx xxx 0.29 xxx 0.08

Level of Service Module:
Queue: xxx xxx xxx 0.2 xxx xxx xxx xxx xxx xxx xxx
Stopped Del:xxxxx xxx xxx 9.0 xxx xxx xxx xxx xxx xxx xxx
LOS by Move: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Movement: xxx xxx xxx xxx 0.2 xxx xxx xxx xxx xxx 1.7 xxx
Shared Cap.: xxx xxx xxx xxx 9.0 xxx xxx xxx xxx xxx 26.7 xxx
Shrd StpDel:xxxxx xxx xxx A xxx xxx xxx xxx xxx 26.7 xxx
Shared LOS: xxx xxx xxx xxx xxx xxx xxx xxx xxx
ApproachDel: xxx xxx xxx xxx xxx xxx xxx xxx xxx
ApproachLOS: xxx xxx xxx xxx xxx xxx xxx xxx xxx

Intersection #5: Airport/SR-120 EB



Lanes:	Initial	Vol:	Stomach	Incontinent	Prostate	Include
0	0	0	0	0	0	80
0	0	0	0	0	0	363
0	0	0	0	0	0	1
0	0	0	0	0	0	0

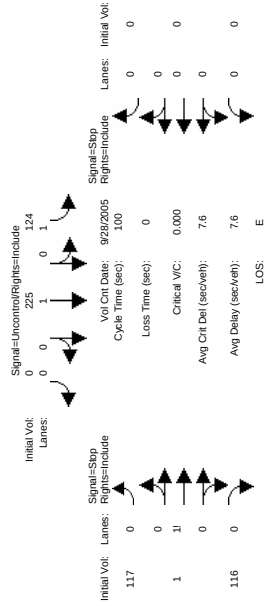
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R

Volume	Module	>>	Count	Date:	28 Sep 2005	<<
Base Vol:		0	363	80	124 216	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	363	80	124 216	0	117
Added Vol:	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0
Initial Fut:	0	363	80	124 216	0	117
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	363	80	124 216	0	117
Reduc Vol:	0	0	0	0	0	0
Final Vol:	0	363	80	124 216	0	117

[illegible][illegible]

Level of Service Module:										
Queue:	xxxxxx	xxxxxx	xxxxxx	0.4	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Stopped Del:	xxxxxx	xxxxxx	xxxxxx	8.6	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
LOS by Move:	xxxxxx	xxxxxx	xxxxxx	A	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT - LTR - RT
Shared Cap:	xxxxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxxxx	353	xxxxxx	xxxxxx
Shared Queue:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	2.2	xxxxxx	xxxxxx
Shrd Stpbel:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	23.0	xxxxxx	xxxxxx
Shared LOS:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	23.0	xxxxxx	xxxxxx
ApproachDel:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	23.0	xxxxxx	xxxxxx
ApproachLOS:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	23.0	xxxxxx	xxxxxx

Intersection #5: Airport/SR-120 EB

[illegible]

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R

Volume	Module	>>	Count	Date:	28 Sep 2005	<<
Base Vol:	0	353	80	124	216	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	363	80	124	216	0
Added Vol:	0	203	0	9	0	78
PasserByVol:	0	0	0	0	0	0
Initial Fut:	0	566	80	124	225	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	566	80	124	225	0
Reduc Vol:	0	0	0	0	0	0
Final Vol:	0	566	80	124	225	0

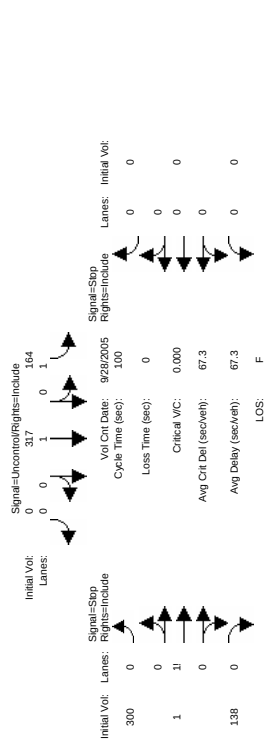
Critical Gap Module:
Critical Gp:xxxxx xxx xxxx
FollowUpTim:xxxxx xxx xxxx
6.4 6.5 6.2 xxxxx xxxx xxxxx
3.5 4.0 3.3 xxxxx xxxx xxxxx

Capacity Module:	646	xxx	xxxx	1079	1119	225	xxx	xxx	xxxx
Conflict Vol:	xxx	xxx	xxxx	xxx	xxx	819	xxx	xxx	xxxx
Potent Cap:	xxx	xxx	xxxx	244	209	819	xxx	xxx	xxxx
Move Cap:	xxx	xxx	xxxx	219	181	819	xxx	xxx	xxxx
Vol/ume/Cap:	xxx	xxx	xxxx	0.13	0.01	0.14	xxx	xxx	xxxx
	xxx	xxx	xxxx	0.53	0.01	0.14	xxx	xxx	xxxx

Level of Service Module:										
Queue:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	0.4	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Stopped Del:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	9.4	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
LOS by Move:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	A	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Movement:	LT	LTR	RT	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Shared Queue:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Shrd Stpbel:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
Shrd LOS:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
ApproachDel:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx
ApproachLOS:	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx

Level of Service Computer Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #5: Airport/SR-120 EB



Lanes: 0 0 0 249 54
Initial Vol: 0 0 0 1 0

Signal-Uncontrolled/Rights-Include

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module: >> Count Date: 28 Sep 2005 <<

Base Vol: 0 249 54 164 317 0 300 1 138 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 249 54 164 317 0 300 1 138 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 249 54 164 317 0 300 1 138 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 0 249 54 164 317 0 300 1 138 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 0 249 54 164 317 0 300 1 138 0 0 0

Critical Gap Module:

Critical Gap:xxxxx xxx xxx 4.1 xxx xxx 6.4 6.5 6.2 xxxxxx xxx xxx
FollowupPlm:xxxxx xxx xxx 2.2 xxx xxx 3.5 4.0 3.3 xxxxxx xxx xxx

Capacity Module:

Conflict Vol: xxx xxx 303 xxx 921 948 317 xxx xxx
Potential Cap.: xxx xxx 1269 xxx 303 728 xxx xxx
Move Cap.: xxx xxx 1269 xxx 273 728 xxx xxx
Volume/Cap: xxx xxx 0.13 xxx 1.10 0.00 0.19 xxx xxx

Level of Service Module:

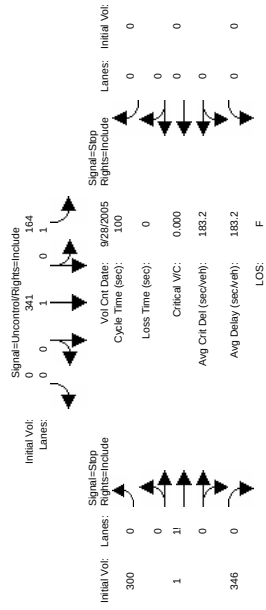
Queue: xxxxxx xxx 0.4 xxx xxx 8.3 xxx xxx
Stopped Del:xxxxx xxx 8.3 xxx xxx
LOS by Move: A

Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxx xxx xxx xxx 339 xxx 339 xxx
Shared Queue:xxxxx xxx xxx xxx 20.5 xxx xxx
Shrd StpDel:xxxxx xxx xxx xxx 184 xxx xxx

Shared LOS: xxxxxx xxxxxx
ApproachDel: xxxxxx 184.3 F
ApproachLOS: xxxxxx

Level of Service Computer Report
2000 HCM Unsignalized (Future Volume Alternative)
Project PM

Intersection #5: Airport/SR-120 EB



Lanes: 0 0 0 406 54
Initial Vol: 0 0 0 1 0

Signal-Uncontrolled/Rights-Include

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module: >> Count Date: 28 Sep 2005 <<

Base Vol: 0 249 54 164 317 0 300 1 138 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 249 54 164 317 0 300 1 138 0 0 0
Added Vol: 0 157 0 0 24 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 406 54 164 341 0 300 1 346 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 0 406 54 164 341 0 300 1 346 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 0 406 54 164 341 0 300 1 346 0 0 0

Critical Gap Module:

Critical Gap:xxxxx xxx xxx 4.1 xxx xxx 6.4 6.5 6.2 xxxxxx xxx xxx
FollowupPlm:xxxxx xxx xxx 2.2 xxx xxx 3.5 4.0 3.3 xxxxxx xxx xxx

Capacity Module:

Conflict Vol: xxx xxx 460 xxx 1102 1129 341 xxx xxx
Potential Cap.: xxx xxx 1112 xxx 236 206 706 xxx xxx
Move Cap.: xxx xxx 1112 xxx 210 175 706 xxx xxx
Volume/Cap: xxx xxx 0.15 xxx 1.43 0.01 0.49 xxx xxx

Level of Service Module:

Queue: xxxxxx xxx 0.5 xxx xxx 8.5 xxx xxx
Stopped Del:xxxxx xxx 8.5 xxx xxx
LOS by Move: A

Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxx xxx xxx xxx 336 xxx 336 xxx
Shared Queue:xxxxx xxx xxx xxx 44.4 xxx xxx
Shrd StpDel:xxxxx xxx xxx xxx 454 xxx xxx

Shared LOS: xxxxxx xxxxxx
ApproachDel: xxxxxx 454.2 F
ApproachLOS: xxxxxx

Intersection #6: Airport/Atherton

Initial Vol:	Signal=Stop Remainder	Vol Crt Date:	Vol Crt Time (sec):	Loss Time (sec):	Signal=Stop Right=Index	Lanes:	Initial Vol:
84	0	10/12/2005	100	0	1	89	
1	1			0	0	0	
5	0		0.000		1	4	
0	0		4.4		0	0	
5	1		4.4		1	7	
			LOS:	C			

Lanes:	1	0	1	0	1
Initial Vol:	4	173			11

Signal=lnControl/BioRx=Include

Approach: Movement:	North Bound				South Bound				East Bound				West Bound							
	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
	Count				Date															
Module: >>																				
Volume: 12 Oct 2005 <<																				
Base Vol: 4 173 11 109 256 145																				
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00																				
Initial Bse: 4 173 11 109 256 145																				
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0																				
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0																				
Initial Fut: 4 173 11 109 256 145																				
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00																				
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00																				
PHF Volume: 4 173 11 109 256 145																				
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0																				
Final Vol: 4 173 11 109 256 145																				
Critical Gap Module:																				
Critical Gap: 4.1 xxxx xxxxx																				
Followup: 2.2 xxxx xxxxx																				
Followuprim: 3.5 4.0 3.3 3.5 4.0 3.3																				

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Intersection #6: Airport/Atherton

Initial Vol.	Signal-Stop Aggr-Increase	Vol Cor. Date:	Cycle Time (sec.)	Loss Time (sec.)	Critical VC:	Avg Crit Del (sec/veh):	Avg Delay (sec/veh):	LOS:
84	0	10/12/2005	100					
	1		0		0.000	7.8	7.8	F
5	0							
	1							
5	0							
	1							

Lanes:	1	0	1	0	1
Initial Vol:	4	283	283	1	1

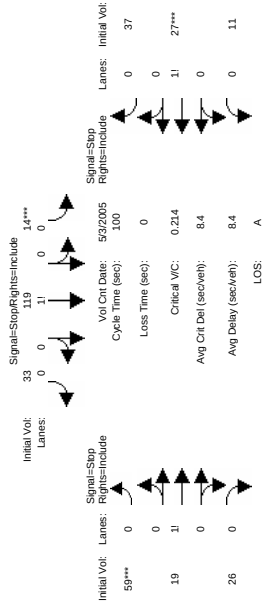
Signal=Incontrol/Right=Include

Approach: Movement:	North Bound			South Bound			East Bound			West Bound		
	L	T	R	L	T	R	L	T	R	L	T	R
Module: >> Count date: 12 Oct 2005 <<												
Base Vol:	4	173	11	109	256	145	84	5	5	7	4	89
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	173	11	109	256	145	84	5	5	7	4	89
Added Vol:	0	110	0	65	166	0	0	0	0	0	0	47
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Adj:	4	283	11	174	422	145	84	5	5	7	4	136
User Fut:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHUF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	4	283	11	174	422	145	84	5	5	7	4	136
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol:	4	283	11	174	422	145	84	5	5	7	4	136
Critical Gap Module:												
Critical Gap:	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2	7.1	6.5	6.2
FollowingTm:	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3	3.5	4.0	3.3

[illegible][illegible]

Level of Service Computer Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM

Intersection #7: Airport/Woodward



Initial Vol: 59
Lanes: 0
Signal-Stop Rights-Include: 0
Signal-Stop Rights-Exclude: 0
Cycle Time (sec): 100
Loss Time (sec): 0
Critical VC: 0.214
Avg Cnt Del (sec/veh): 8.4
Avg Delay (sec/veh): 8.4
LOS: A

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Volume Module: >> Count Date: 3 May 2005 <<

Base Vol: 19 136 11 14 119 33 59 19 26 11 27 37
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 19 136 11 14 119 33 59 19 26 11 27 37
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 19 136 11 14 119 33 59 19 26 11 27 37
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 19 136 11 14 119 33 59 19 26 11 27 37
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 19 136 11 14 119 33 59 19 26 11 27 37
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 19 136 11 14 119 33 59 19 26 11 27 37

Saturation Flow Module:

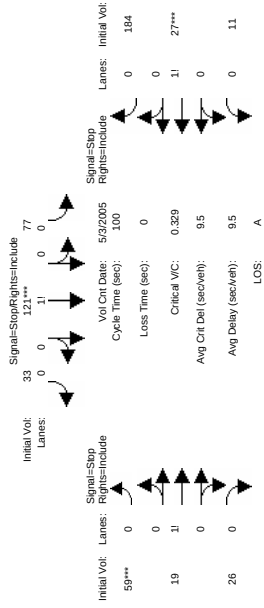
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.11 0.82 0.07 0.08 0.72 0.20 0.57 0.18 0.25 0.15 0.36 0.49
Final Sat: 89 635 51 67 566 157 410 132 181 110 269 369

Capacity Analysis Module:

Vol/Sat: 0.21 0.21 0.21 0.21 0.21 0.21 0.14 0.14 0.14 0.10 0.10 0.10
Crit Moves: 8.6 8.6 8.6 8.5 8.5 8.5 8.4 8.4 8.4 7.9 7.9 7.9
Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay Adj: 8.6 8.6 8.6 8.5 8.5 8.5 8.4 8.4 8.4 7.9 7.9 7.9
AdjDel/Veh: 8.6 8.6 8.6 8.5 8.5 8.5 8.4 8.4 8.4 7.9 7.9 7.9
LOS by Move: A A A A A A A A A A A A
ApproachDel: 8.6 8.6 8.5 8.4 8.4 8.4 7.9 7.9 7.9 7.9 7.9 7.9
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
ApprAdjDel: 8.6 8.6 8.5 8.4 8.4 8.4 7.9 7.9 7.9 7.9 7.9 7.9
LOS by Appr: A A A A A A A A A A A A

Level of Service Computer Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Project AM

Intersection #7: Airport/Woodward



Initial Vol: 59
Lanes: 0
Signal-Stop Rights-Include: 0
Signal-Stop Rights-Exclude: 0
Cycle Time (sec): 100
Loss Time (sec): 0
Critical VC: 0.329
Avg Cnt Del (sec/veh): 9.5
Avg Delay (sec/veh): 9.5
LOS: A

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Volume Module: >> Count Date: 3 May 2005 <<

Base Vol: 19 136 11 14 119 33 59 19 26 11 27 37
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 19 136 11 14 119 33 59 19 26 11 27 37
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 19 140 11 14 119 33 59 19 26 11 27 37
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 19 140 11 14 119 33 59 19 26 11 27 37
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 19 140 11 14 119 33 59 19 26 11 27 37
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 19 140 11 14 119 33 59 19 26 11 27 37

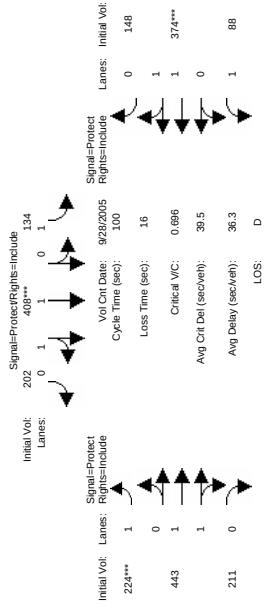
Saturation Flow Module:

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.11 0.83 0.06 0.33 0.53 0.14 0.57 0.18 0.25 0.05 0.12 0.83
Final Sat: 77 564 44 234 368 100 368 119 162 37 91 617

Capacity Analysis Module:

Vol/Sat: 0.25 0.25 0.25 0.25 0.25 0.25 0.16 0.16 0.16 0.30 0.30 0.30
Crit Moves: 9.4 9.4 9.4 10.0 10.0 10.0 9.0 9.0 9.0 9.3 9.3 9.3
Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay Adj: 9.4 9.4 9.4 10.0 10.0 10.0 9.0 9.0 9.0 9.3 9.3 9.3
AdjDel/Veh: 9.4 9.4 9.4 10.0 10.0 10.0 9.0 9.0 9.0 9.3 9.3 9.3
LOS by Move: A A A A A A A A A A A A
ApproachDel: 9.4 9.4 10.0 10.0 10.0 10.0 9.0 9.0 9.0 9.3 9.3 9.3
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
ApprAdjDel: 9.4 9.4 10.0 10.0 10.0 10.0 9.0 9.0 9.0 9.3 9.3 9.3
LOS by Appr: A A A A A A A A A A A A

Intersection #11: Union/Yosemite



Initial Vol: 237***
Lanes: 1 0 1 1 0 0
Signal-Protect/Right=include

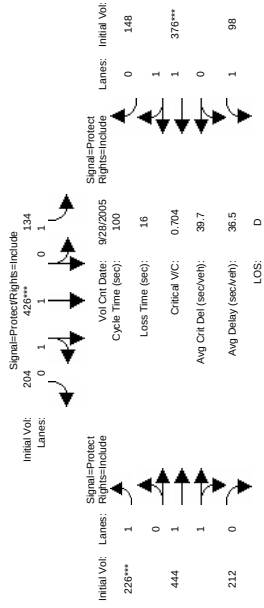
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10

Volume Module: >> Count Date: 28 Sep 2005 <<
Base Vol: 237 557 76 134 408 202 224 443 211 88 374 148
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 237 557 76 134 408 202 224 443 211 88 374 148
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 237 557 76 134 408 202 224 443 211 88 374 148
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 237 557 76 134 408 202 224 443 211 88 374 148
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 237 557 76 134 408 202 224 443 211 88 374 148
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 237 557 76 134 408 202 224 443 211 88 374 148

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.93 0.93 0.95 0.90 0.90 0.95 0.90 0.90 0.95 0.91 0.91
Lanes: 1.00 1.76 0.24 1.00 1.34 0.66 1.00 1.35 0.65 1.00 1.43 0.57
Final Sat: 1805 3119 426 1805 2294 1136 1805 2328 1109 1805 2475 980

Capacity Analysis Module:
Vol/Sat: 0.13 0.18 0.18 0.07 0.18 0.18 0.12 0.19 0.19 0.05 0.15 0.15
Crit Moves: ****
Green Time: 18.9 31.4 31.4 13.1 25.6 25.6 17.8 28.9 28.9 10.6 21.7 21.7
Volume/Cap: 0.70 0.57 0.57 0.57 0.70 0.70 0.70 0.66 0.66 0.46 0.70 0.70
Uniform Del: 37.9 28.7 28.7 40.8 33.7 33.7 38.5 31.2 31.2 42.0 36.1 36.1
IncrementDel: 6.2 0.7 0.7 3.3 2.5 2.5 6.5 1.6 1.6 1.7 2.9 2.9
InitQueueDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 44.0 29.4 29.4 44.1 36.2 36.2 45.0 32.8 32.8 43.7 39.0 39.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 44.0 29.4 29.4 44.1 36.2 36.2 45.0 32.8 32.8 43.7 39.0 39.0
HCM2kAvg: 7 8 8 5 10 10 7 9 9 3 8 8

Intersection #11: Union/Yosemite



Initial Vol: 237***
Lanes: 1 0 1 1 0 0
Signal-Protect/Right=include

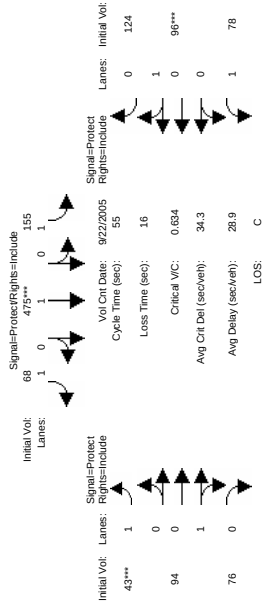
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10

Volume Module: >> Count Date: 28 Sep 2005 <<
Base Vol: 237 557 76 134 408 202 224 443 211 88 374 148
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 237 557 76 134 408 202 224 443 211 88 374 148
Added Vol: 0 12 6 0 18 2 2 1 1 10 2 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 237 557 82 134 426 204 226 444 212 98 376 148
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 237 557 82 134 426 204 226 444 212 98 376 148
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 237 557 82 134 426 204 226 444 212 98 376 148
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 237 557 82 134 426 204 226 444 212 98 376 148

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.93 0.93 0.95 0.90 0.90 0.95 0.90 0.90 0.95 0.91 0.91
Lanes: 1.00 1.75 0.25 1.00 1.35 0.65 1.00 1.35 0.65 1.00 1.44 0.56
Final Sat: 1805 3095 446 1805 2321 1112 1805 2326 1111 1805 2482 977

Capacity Analysis Module:
Vol/Sat: 0.13 0.18 0.18 0.07 0.18 0.18 0.13 0.19 0.19 0.05 0.15 0.15
Crit Moves: ****
Green Time: 18.6 31.8 31.8 12.9 26.1 26.1 17.8 28.8 28.8 10.5 21.5 21.5
Volume/Cap: 0.70 0.58 0.58 0.58 0.70 0.70 0.70 0.66 0.66 0.51 0.70 0.70
Uniform Del: 38.1 28.5 28.5 41.0 33.5 33.5 38.6 31.4 31.4 42.3 36.3 36.3
IncrementDel: 6.6 0.7 0.7 3.6 2.6 2.6 6.9 1.7 1.7 2.4 3.1 3.1
InitQueueDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 44.7 29.2 29.2 44.6 36.0 36.0 45.6 33.1 33.1 44.7 39.4 39.4
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 44.7 29.2 29.2 44.6 36.0 36.0 45.6 33.1 33.1 44.7 39.4 39.4
HCM2kAvg: 7 8 8 5 10 10 7 9 9 3 8 8

Intersection #12: Union/Wawona



Initial Vol: 89**
Lanes: 1 0 1 1 0 146
Signal-Protect/Right-of-Way: include

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10

Volume Module: >> Count Date: 22 Sep 2005 <<

Base Vol: 89 589 146 155 475 68 43 94 76 78 96 124
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 89 589 146 155 475 68 43 94 76 78 96 124
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 89 589 146 155 475 68 43 94 76 78 96 124
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 89 589 146 155 475 68 43 94 76 78 96 124
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 89 589 146 155 475 68 43 94 76 78 96 124
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 89 589 146 155 475 68 43 94 76 78 96 124

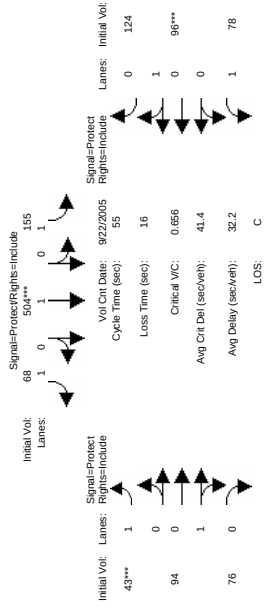
Saturation Flow Module:

Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adj: 0.95 0.92 0.92 0.95 0.93 0.93 0.95 0.92 0.92 0.95 0.92 0.92
Lanes: 1.00 1.60 0.40 1.00 1.00 1.00 1.00 0.55 0.45 1.00 0.44 0.56
Final Sat: 1805 2806 696 1805 1900 1615 1805 980 793 1805 759 980

Capacity Analysis Module:

Vol/Sat: 0.05 0.21 0.21 0.09 0.25 0.04 0.02 0.10 0.10 0.04 0.13 0.13
Crit Moves: 7.0 13.7 13.7 8.3 15.0 15.0 7.0 10.0 10.0 7.0 10.0 10.0
Volume/Cap: 0.39 0.84 0.84 0.57 0.92 0.15 0.19 0.53 0.53 0.34 0.70 0.70
Uniform Del: 22.0 19.6 19.6 21.7 19.4 15.2 21.5 20.4 20.4 21.9 21.1 21.1
Incremental Del: 1.1 7.5 7.5 2.8 21.2 0.2 0.4 1.6 1.6 0.9 6.6 6.6
Incremental Del: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 23.1 27.1 27.1 24.5 40.6 15.3 21.9 22.0 22.0 22.8 27.7 27.7
User Del/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 23.1 27.1 27.1 24.5 40.6 15.3 21.9 22.0 22.0 22.8 27.7 27.7
HCM2kAvg: 2 9 9 3 9 1 1 3 3 2 5 5

Intersection #12: Union/Wawona



Initial Vol: 89**
Lanes: 1 0 1 1 0 146
Signal-Protect/Right-of-Way: include

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10

Volume Module: >> Count Date: 22 Sep 2005 <<

Base Vol: 89 589 146 155 475 68 43 94 76 78 96 124
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 89 589 146 155 475 68 43 94 76 78 96 124
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 89 608 146 155 504 68 43 94 76 78 96 124
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 89 608 146 155 504 68 43 94 76 78 96 124
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 89 608 146 155 504 68 43 94 76 78 96 124
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 89 608 146 155 504 68 43 94 76 78 96 124

Saturation Flow Module:

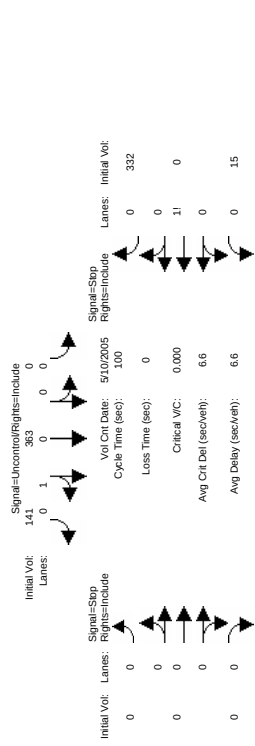
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adj: 0.95 0.92 0.92 0.95 0.93 0.93 0.95 0.92 0.92 0.95 0.92 0.92
Lanes: 1.00 1.61 0.39 1.00 1.00 1.00 1.00 0.55 0.45 1.00 0.44 0.56
Final Sat: 1805 2827 679 1805 1900 1615 1805 980 793 1805 759 980

Capacity Analysis Module:

Vol/Sat: 0.05 0.22 0.22 0.09 0.27 0.04 0.02 0.10 0.10 0.04 0.13 0.13
Crit Moves: 7.0 13.8 13.8 8.2 15.0 15.0 7.0 10.0 10.0 7.0 10.0 10.0
Volume/Cap: 0.39 0.86 0.86 0.58 0.97 0.15 0.19 0.53 0.53 0.34 0.70 0.70
Uniform Del: 22.0 19.6 19.6 21.8 19.8 15.2 21.5 20.4 20.4 21.9 21.1 21.1
Incremental Del: 1.1 8.3 8.3 3.1 32.5 0.2 0.4 1.6 1.6 0.9 6.6 6.6
Incremental Del: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 23.1 27.9 27.9 24.9 52.3 15.3 21.9 22.0 22.0 22.8 27.7 27.7
User Del/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 23.1 27.9 27.9 24.9 52.3 15.3 21.9 22.0 22.0 22.8 27.7 27.7
HCM2kAvg: 2 9 9 3 11 1 1 3 3 2 5 5

Level of Service Computer Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #14: Union/SR-120 WB



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module: >> Count Date: 10 May 2005 <<

Base Vol: 15 577 0 0 363 141 0 0 0 0 15 0 332
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 15 577 0 0 363 141 0 0 0 0 15 0 332
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 15 577 0 0 363 141 0 0 0 0 15 0 332
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 15 577 0 0 363 141 0 0 0 0 15 0 332
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 15 577 0 0 363 141 0 0 0 0 15 0 332

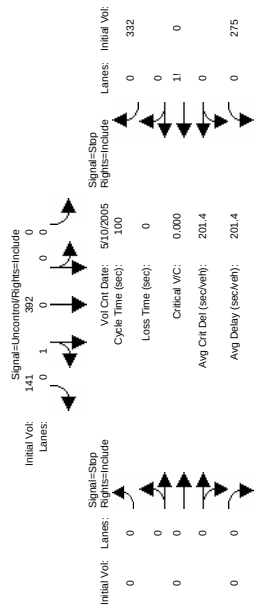
Critical Gap Module:
Critical Gap: 4.1 xxxx xxxx xxxx xxxx xxxx 6.4 xxxx 6.2
FollowupTm: 2.2 xxxx xxxx xxxx xxxx xxxx 3.5 xxxx 3.3

Capacity Module:
Conflict Vol: 504 xxxx xxxx xxxx xxxx xxxx 1041 xxxx 577
Potential Cap.: 1071 xxxx xxxx xxxx xxxx xxxx 257 xxxx 520
Move Cap.: 1071 xxxx xxxx xxxx xxxx xxxx 254 xxxx 520
Volume/Cap: 0.01 xxxx xxxx xxxx xxxx xxxx 0.06 xxxx 0.64

Level of Service Module:
Queue: 0.0 xxxx xxxx xxxx xxxx xxxx 1041 xxxx 577
Stopped Del: 8.4 xxxx xxxx xxxx xxxx xxxx 257 xxxx 520
LOS by Move: A * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx 498 xxxx
Shared Queue: xxxx xxxx xxxx xxxx xxxx 5.4 xxxx
Shrd StpDel: xxxx xxxx xxxx xxxx xxxx 27.3 xxxx
Shared LOS: * * * * *
ApproachDel: xxxxxx * xxxxxx * 27.3
ApproachLOS: * * * * *

Level of Service Computer Report
2000 HCM Unsignalized (Future Volume Alternative)
Project PM

Intersection #14: Union/SR-120 WB



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module: >> Count Date: 10 May 2005 <<

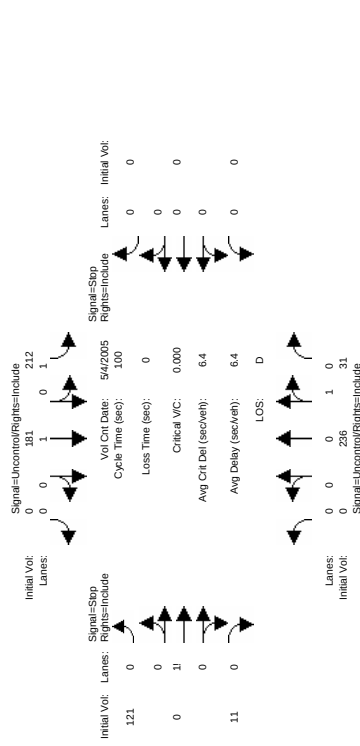
Base Vol: 15 577 0 0 363 141 0 0 0 0 15 0 332
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 15 577 0 0 363 141 0 0 0 0 15 0 332
Added Vol: 94 19 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 109 596 0 0 392 141 0 0 0 0 275 0 332
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 109 596 0 0 392 141 0 0 0 0 275 0 332
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 109 596 0 0 392 141 0 0 0 0 275 0 332

Critical Gap Module:
Critical Gap: 4.1 xxxx xxxx xxxx xxxx xxxx 6.4 xxxx 6.2
FollowupTm: 2.2 xxxx xxxx xxxx xxxx xxxx 3.5 xxxx 3.3

Capacity Module:
Conflict Vol: 533 xxxx xxxx xxxx xxxx 1277 xxxx 596
Potential Cap.: 1045 xxxx xxxx xxxx xxxx 186 xxxx 507
Move Cap.: 1045 xxxx xxxx xxxx xxxx 171 xxxx 507
Volume/Cap: 0.10 xxxx xxxx xxxx xxxx 1.61 xxxx 0.65

Level of Service Module:
Queue: 0.3 xxxx xxxx xxxx xxxx xxxx 1277 xxxx 596
Stopped Del: 8.3 xxxx xxxx xxxx xxxx xxxx 186 xxxx 507
LOS by Move: A * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx 268 xxxx
Shared Queue: xxxx xxxx xxxx xxxx xxxx 47.2 xxxx
Shrd StpDel: xxxx xxxx xxxx xxxx xxxx 611 xxxx
Shared LOS: * * * * *
ApproachDel: xxxxxx * xxxxxx * 610.6
ApproachLOS: * * * * *

Intersection #15: Union/SR-120 EB



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

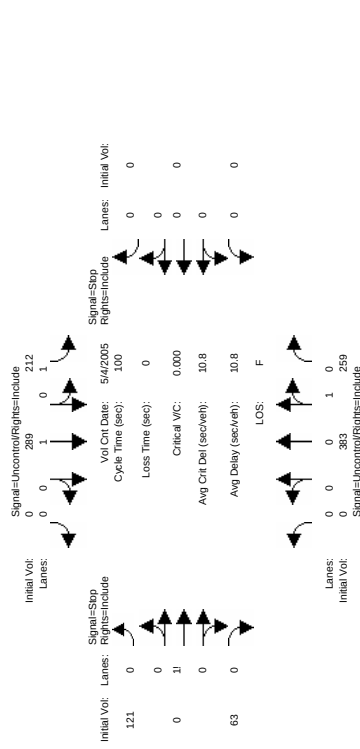
Volume Module: >> Count Date: 4 May 2005 <<
Base Vol: 0 236 31 212 181 0 121 0 11 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 236 31 212 181 0 121 0 11 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 236 31 212 181 0 121 0 11 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 0 236 31 212 181 0 121 0 11 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 0 236 31 212 181 0 121 0 11 0 0 0

Critical Gap Module:
Critical Gap:xxxxx xxx xxx 4.1 xxx xxx 6.4 xxx 6.2 xxx xxx xxx
FollowupPlm:xxxxx xxx xxx 2.2 xxx xxx 3.5 xxx 3.3 xxx xxx xxx

Capacity Module:
Conflict Vol: xxx xxx 267 xxx xxx 857 xxx 181 xxx xxx
Potent Cap.: xxx xxx xxx 1308 xxx xxx 331 xxx 867 xxx xxx
Move Cap.: xxx xxx xxx 1308 xxx xxx 289 xxx 867 xxx xxx
Volume/Cap: xxx xxx xxx 0.16 xxx xxx 0.42 xxx 0.01 xxx xxx

Level of Service Module:
Queue: xxx xxx xxx 0.6 xxx xxx xxx xxx xxx xxx
Stopped Del:xxxxx xxx xxx 8.3 xxx xxx xxx xxx xxx xxx
LOS by Move: A
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxx xxx xxx xxx xxx xxx 306 xxx xxx xxx xxx
Shared Queue:xxxxx xxx xxx xxx xxx 2.1 xxx xxx xxx xxx
Shrd StpDel:xxxxx xxx xxx xxx xxx 25.3 xxx xxx xxx xxx
Shared LOS: xxx xxx xxx xxx xxx xxx 25.3 xxx xxx
ApproachDel: xxx xxx 25.3 xxx xxx
ApproachLOS: xxx xxx

Intersection #15: Union/SR-120 EB



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module: >> Count Date: 4 May 2005 <<
Base Vol: 0 236 31 212 181 0 121 0 11 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 236 31 212 181 0 121 0 11 0 0 0
Added Vol: 0 147 228 0 108 0 0 0 52 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 383 259 212 289 0 121 0 63 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 0 383 259 212 289 0 121 0 63 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 0 383 259 212 289 0 121 0 63 0 0 0

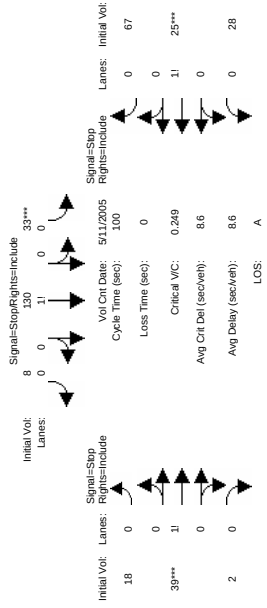
Critical Gap Module:
Critical Gap:xxxxx xxx xxx 4.1 xxx xxx 6.4 xxx 6.2 xxx xxx xxx
FollowupPlm:xxxxx xxx xxx 2.2 xxx xxx 3.5 xxx 3.3 xxx xxx xxx

Capacity Module:
Conflict Vol: xxx xxx xxx 642 xxx xxx 1226 xxx 289 xxx xxx
Potent Cap.: xxx xxx xxx 952 xxx xxx 199 xxx 755 xxx xxx
Move Cap.: xxx xxx xxx 952 xxx xxx 165 xxx 755 xxx xxx
Volume/Cap: xxx xxx xxx 0.22 xxx xxx 0.73 xxx 0.08 xxx xxx

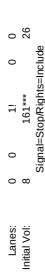
Level of Service Module:
Queue: xxx xxx xxx 0.9 xxx xxx xxx xxx xxx xxx
Stopped Del:xxxxx xxx xxx 9.9 xxx xxx xxx xxx xxx xxx
LOS by Move: A
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxx xxx xxx xxx xxx xxx 225 xxx xxx xxx xxx
Shared Queue:xxxxx xxx xxx xxx xxx 6.1 xxx xxx xxx xxx
Shrd StpDel:xxxxx xxx xxx xxx xxx 66.7 xxx xxx xxx xxx
Shared LOS: xxx xxx xxx xxx xxx xxx 66.7 xxx xxx
ApproachDel: xxx xxx 66.7 xxx xxx
ApproachLOS: xxx xxx

Level Of Service Computation Report
 2000 HCM 4-Way Stop (Future Volume Alternative)
 Existing AM

Intersection #17: Union/Woodward



SOT



Signal=Stop/Rights=Include

[illegible]

Volume Module: >> Count Date: 11 May 2005 <<

Volume Number	Issue	Year	Page	Page	Page
Base Vol.	8	161	26	33	130
	8	161	26	18	39
	2	28	25	67	

Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Ese:	8	161	26	33	130	8	18	39	2	28	25
Added Vol:	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	8	161	26	33	130	8	18	39	2	28	25
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	8	161	26	33	130	8	18	39	2	28	25
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	161	26	33	130	8	18	39	2	28	25
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MUF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	8	161	26	33	130	8	18	39	2	28	25

[illegible]

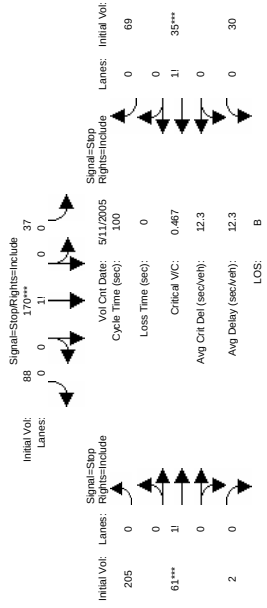
Saturation:	1.00	1.00	1.00	1.00	1.00
Adjustment:	1.00	1.00	1.00	1.00	1.00
Lanes:	0.04	0.83	0.13	0.19	0.76
	0.05	0.31	0.66	0.03	0.23
Final Sat.: :	32	647	104	148	581
	36	208	452	23	175
	418	156	418	1.00	1.00

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

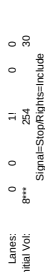
Capacity Analysis Module:										
	0.25	0.25	0.25	0.22	0.22	0.09	0.09	0.09	0.16	0.16
Vol/Sat:	0.25	0.25	0.25	****	****	****	****	****	****	****
Crit Moves:										
Delay/Veh:	8.8	8.8	8.8	8.8	8.8	8.3	8.3	8.3	8.3	8.3
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdpDel/Veh:	8.8	8.8	8.8	8.8	8.3	8.3	8.3	8.3	8.3	8.3
LOS by Move:	A	A	A	A	A	A	A	A	A	A
ApproachDel:		8.8		8.8		8.3		8.3		8.3
Delay Adj:		1.00		1.00		1.00		1.00		1.00
ApprAdpDel:		8.8		8.8		8.3		8.3		8.3

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Project AM

Intersection #17: Union/Woodward



:os:



Signal=StopRights=Include

[illegible]

Volume Module: >> Count Date: 11 May 2005 <<

[illegible]

Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	8	161	26	33	130	8	18	39	2	28	25	67
Added Vol:	0	93	4	4	40	80	187	22	0	2	10	2
PasserbyVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	8	254	30	37	170	88	205	61	2	30	35	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	8	254	30	37	170	88	205	61	2	30	35	69
Reduc Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	254	30	37	170	88	205	61	2	30	35	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MUF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	8	254	30	37	170	88	205	61	2	30	35	69

Category	Sub-category	Value
Construction	Construction of new buildings	100
	Construction of new roads	100
Manufacturing	Manufacturing of new buildings	100
	Manufacturing of new roads	100
Transportation	Transportation of new buildings	100
	Transportation of new roads	100
Communication	Communication of new buildings	100
	Communication of new roads	100
Energy	Energy of new buildings	100
	Energy of new roads	100
Healthcare	Healthcare of new buildings	100
	Healthcare of new roads	100
Education	Education of new buildings	100
	Education of new roads	100
Social Services	Social Services of new buildings	100
	Social Services of new roads	100
Culture	Culture of new buildings	100
	Culture of new roads	100
Environment	Environment of new buildings	100
	Environment of new roads	100
Economy	Economy of new buildings	100
	Economy of new roads	100
Politics	Politics of new buildings	100
	Politics of new roads	100
Law	Law of new buildings	100
	Law of new roads	100
Science	Science of new buildings	100
	Science of new roads	100
Technology	Technology of new buildings	100
	Technology of new roads	100
Art	Art of new buildings	100
	Art of new roads	100
Religion	Religion of new buildings	100
	Religion of new roads	100
Philosophy	Philosophy of new buildings	100
	Philosophy of new roads	100
History	History of new buildings	100
	History of new roads	100
Literature	Literature of new buildings	100
	Literature of new roads	100
Music	Music of new buildings	100
	Music of new roads	100
Dance	Dance of new buildings	100
	Dance of new roads	100
Theater	Theater of new buildings	100
	Theater of new roads	100
Film	Film of new buildings	100
	Film of new roads	100
Television	Television of new buildings	100
	Television of new roads	100
Radio	Radio of new buildings	100
	Radio of new roads	100
Internet	Internet of new buildings	100
	Internet of new roads	100
Mobile Phone	Mobile Phone of new buildings	100
	Mobile Phone of new roads	100
Smartphone	Smartphone of new buildings	100
	Smartphone of new roads	100
Tablet	Tablet of new buildings	100
	Tablet of new roads	100
Wearable Device	Wearable Device of new buildings	100
	Wearable Device of new roads	100
Smart Home	Smart Home of new buildings	100
	Smart Home of new roads	100
Smart City	Smart City of new buildings	100
	Smart City of new roads	100
Smart Building	Smart Building of new buildings	100
	Smart Building of new roads	100
Smart Road	Smart Road of new buildings	100
	Smart Road of new roads	100
Smart Infrastructure	Smart Infrastructure of new buildings	100
	Smart Infrastructure of new roads	100
Smart Transportation	Smart Transportation of new buildings	100
	Smart Transportation of new roads	100
Smart Communication	Smart Communication of new buildings	100
	Smart Communication of new roads	100
Smart Energy	Smart Energy of new buildings	100
	Smart Energy of new roads	100
Smart Healthcare	Smart Healthcare of new buildings	100
	Smart Healthcare of new roads	100
Smart Education	Smart Education of new buildings	100
	Smart Education of new roads	100
Smart Social Services	Smart Social Services of new buildings	100
	Smart Social Services of new roads	100
Smart Culture	Smart Culture of new buildings	100
	Smart Culture of new roads	100
Smart Environment	Smart Environment of new buildings	100
	Smart Environment of new roads	100
Smart Economy	Smart Economy of new buildings	100
	Smart Economy of new roads	100
Smart Politics	Smart Politics of new buildings	100
	Smart Politics of new roads	100
Smart Law	Smart Law of new buildings	100
	Smart Law of new roads	100
Smart Science	Smart Science of new buildings	100
	Smart Science of new roads	100
Smart Technology	Smart Technology of new buildings	100
	Smart Technology of new roads	100
Smart Art	Smart Art of new buildings	100
	Smart Art of new roads	100
Smart Religion	Smart Religion of new buildings	100
	Smart Religion of new roads	100
Smart Philosophy	Smart Philosophy of new buildings	100
	Smart Philosophy of new roads	100
Smart History	Smart History of new buildings	100
	Smart History of new roads	100
Smart Literature	Smart Literature of new buildings	100
	Smart Literature of new roads	100
Smart Music	Smart Music of new buildings	100
	Smart Music of new roads	100
Smart Dance	Smart Dance of new buildings	100
	Smart Dance of new roads	100
Smart Theater	Smart Theater of new buildings	100
	Smart Theater of new roads	100
Smart Film	Smart Film of new buildings	100
	Smart Film of new roads	100
Smart Television	Smart Television of new buildings	100
	Smart Television of new roads	100
Smart Radio	Smart Radio of new buildings	100
	Smart Radio of new roads	100
Smart Internet	Smart Internet of new buildings	100
	Smart Internet of new roads	100
Smart Mobile Phone	Smart Mobile Phone of new buildings	100
	Smart Mobile Phone of new roads	100
Smart Smartphone	Smart Smartphone of new buildings	100
	Smart Smartphone of new roads	100

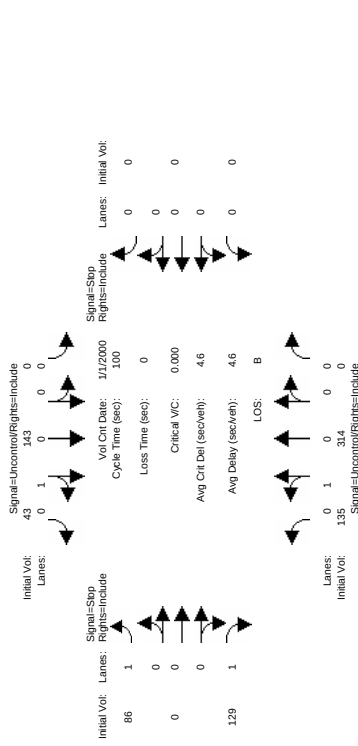
[illegible]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Capacity Analysis Module:									
Vol/Sat:	0.47	0.47	0.47	0.46	0.46	0.46	0.46	0.46	0.24
Crit Moves:	****			****			****		****
Delay/Veh:	12.6	12.6	12.6	12.4	12.4	12.4	13.1	13.1	10.1
Delay/Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay/Veh:	12.6	12.6	12.6	12.4	12.4	12.4	13.1	13.1	10.1
LOS by Move:	B	B	B	B	B	B	B	B	B
ApproachDel:	12.6		12.4				13.1		10.1
Delay Adj:	1.00		1.00				1.00		1.00
ApproachDel:	12.6		12.4				13.1		10.1

Level of Service Computer Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #19: Woodward/Moffat



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module: >> Count Date: 1 Jan 2000 << Lifestyle

Base Vol: 135 314 0 0 143 43 86 0 129 0 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 135 314 0 0 143 43 86 0 129 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 135 314 0 0 143 43 86 0 129 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 135 314 0 0 143 43 86 0 129 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 135 314 0 0 143 43 86 0 129 0 0 0

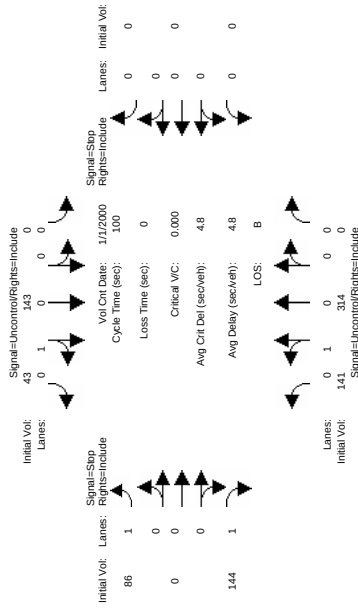
Critical Gap Module:
Critical Gap: 4.1 xxxx xxxxxx xxxxxx 6.4 xxxx 6.2 xxxxxx xxxxxx xxxxxx
FollowupTb: 2.2 xxxx xxxxxx xxxxxx xxxxxx 3.5 xxxxx 3.3 xxxxxx xxxxxx xxxxxx

Capacity Module:
Conflict Vol: 186 xxxxx xxxxx xxxxx 749 xxxxx 165 xxxxx xxxxx xxxxx
Potential Cap.: 1401 xxxxx xxxxx xxxxx xxxxx 383 xxxxx 885 xxxxx xxxxx xxxxx
Move Cap.: 1401 xxxxx xxxxx xxxxx xxxxx 352 xxxxx 885 xxxxx xxxxx xxxxx
Volume/Cap: 0.10 xxxxx xxxxx xxxxx xxxxx 0.24 xxxxx 0.15 xxxxx xxxxx xxxxx

Level of Service Module:
Queue: 0.3 xxxxx xxxxx xxxxx xxxxx 0.9 xxxxx 0.5 xxxxx xxxxx xxxxx
Stopped Del: 7.8 xxxxx xxxxx xxxxx xxxxx 18.5 xxxxx 9.8 xxxxx xxxxx xxxxx
LOS by Move: A * * * * C * A *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: 0.3 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shared Queue: 0.3 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shrd StpDel: 7.8 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shared LOS: A * * * * * * * * * * * * * * * *
ApproachDel: xxxxxx * 13.3 B
ApproachLOS: xxxxxx * xxxxxx * xxxxxx * xxxxxx *

Level of Service Computer Report
2000 HCM Unsignalized (Future Volume Alternative)
Project AM

Intersection #19: Woodward/Moffat



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module: >> Count Date: 1 Jan 2000 << Lifestyle

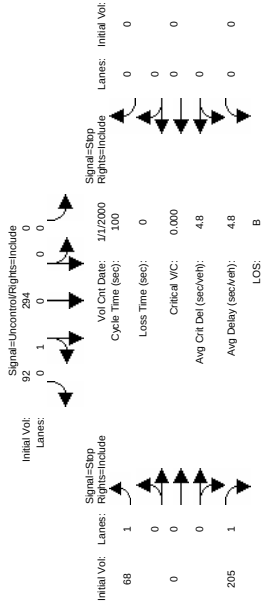
Base Vol: 135 314 0 0 143 43 86 0 129 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 135 314 0 0 143 43 86 0 129 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 141 314 0 0 143 43 86 0 144 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 141 314 0 0 143 43 86 0 144 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 141 314 0 0 143 43 86 0 144 0 0 0

Critical Gap Module:
Critical Gap: 4.1 xxxx xxxxxx xxxxxx xxxxxx 6.4 xxxx 6.2 xxxxxx xxxxxx xxxxxx
FollowupTb: 2.2 xxxx xxxxxx xxxxxx xxxxxx 3.5 xxxxx 3.3 xxxxxx xxxxxx xxxxxx

Capacity Module:
Conflict Vol: 186 xxxxx xxxxx xxxxx xxxxx 761 xxxxx 165 xxxxx xxxxx xxxxx
Potential Cap.: 1401 xxxxx xxxxx xxxxx xxxxx 377 xxxxx 885 xxxxx xxxxx xxxxx
Move Cap.: 1401 xxxxx xxxxx xxxxx xxxxx 345 xxxxx 885 xxxxx xxxxx xxxxx
Volume/Cap: 0.10 xxxxx xxxxx xxxxx xxxxx 0.25 xxxxx 0.16 xxxxx xxxxx xxxxx

Level of Service Module:
Queue: 0.3 xxxxx xxxxx xxxxx xxxxx 1.0 xxxxx 0.6 xxxxx xxxxx xxxxx
Stopped Del: 7.9 xxxxx xxxxx xxxxx xxxxx 18.9 xxxxx 9.9 xxxxx xxxxx xxxxx
LOS by Move: A * * * * C * A *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: 0.3 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shared Queue: 0.3 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shrd StpDel: 7.9 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shared LOS: A * * * * * * * * * * * * * * * *
ApproachDel: xxxxxx * 13.2 B
ApproachLOS: xxxxxx * xxxxxx * xxxxxx * xxxxxx *

Intersection #19: Woodward/Moffat



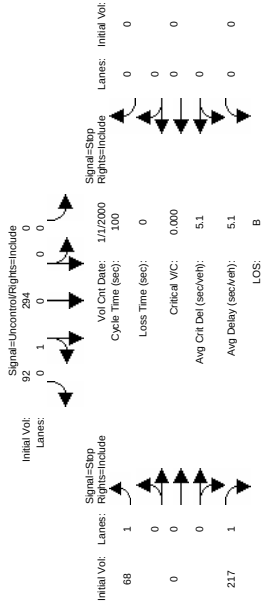
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module: >> Count Date: 1 Jan 2000 << Lifestyle
Base Vol: 106 183 0 0 294 92 68 0 205 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 106 183 0 0 294 92 68 0 205 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 106 183 0 0 294 92 68 0 205 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 106 183 0 0 294 92 68 0 205 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 106 183 0 0 294 92 68 0 205 0 0 0
Critical Gap Module:
Critical Gap: 4.1 xxxx xxxx xxxx xxxx 6.4 xxxx 6.2 xxxx xxxx xxxx
FollowupTm: 2.2 xxxx xxxx xxxx xxxx 3.5 xxxx 3.3 xxxx xxxx xxxx

Capacity Module:
Conflict Vol: 386 xxxx xxxx xxxx 735 xxxx 340 xxxx xxxx xxxx
Potent Cap.: 1184 xxxx xxxx xxxx 390 xxxx 707 xxxx xxxx xxxx
Move Cap.: 1184 xxxx xxxx xxxx 361 xxxx 707 xxxx xxxx xxxx
Volume/Cap: 0.09 xxxx xxxx xxxx 0.19 xxxx 0.29 xxxx xxxx xxxx

Level of Service Module:
Queue: 0.3 xxxx xxxx xxxx xxxx 0.7 xxxx 1.2 xxxx xxxx xxxx
Stopped Del: 8.3 xxxx xxxx xxxx xxxx 17.3 xxxx 12.2 xxxx xxxx xxxx
LOS by Move: A * C * B *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Shared Queue: 0.3 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Shrd StpDel: 8.3 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Shared LOS: A * * * * *
ApproachDel: xxxxxx 13.4 B
ApproachLOS: xxxxxx

Intersection #19: Woodward/Moffat



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

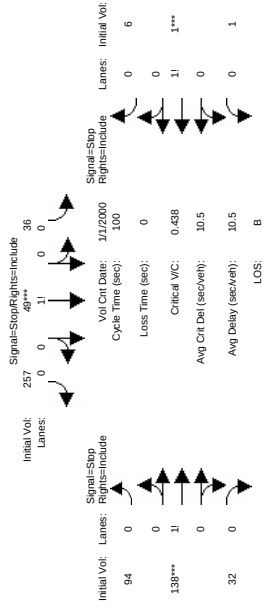
Volume Module: >> Count Date: 1 Jan 2000 << Lifestyle
Base Vol: 106 183 0 0 294 92 68 0 205 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 106 183 0 0 294 92 68 0 205 0 0 0
Added Vol: 17 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 123 183 0 0 294 92 68 0 217 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 123 183 0 0 294 92 68 0 217 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 123 183 0 0 294 92 68 0 217 0 0 0
Critical Gap Module:
Critical Gap: 4.1 xxxx xxxx xxxx xxxx 6.4 xxxx 6.2 xxxx xxxx xxxx
FollowupTm: 2.2 xxxx xxxx xxxx xxxx 3.5 xxxx 3.3 xxxx xxxx xxxx

Capacity Module:
Conflict Vol: 386 xxxx xxxx xxxx 769 xxxx 340 xxxx xxxx xxxx
Potent Cap.: 1184 xxxx xxxx xxxx 372 xxxx 707 xxxx xxxx xxxx
Move Cap.: 1184 xxxx xxxx xxxx 340 xxxx 707 xxxx xxxx xxxx
Volume/Cap: 0.10 xxxx xxxx xxxx 0.20 xxxx 0.31 xxxx xxxx xxxx

Level of Service Module:
Queue: 0.3 xxxx xxxx xxxx xxxx 0.7 xxxx 1.3 xxxx xxxx xxxx
Stopped Del: 8.4 xxxx xxxx xxxx xxxx 18.2 xxxx 12.3 xxxx xxxx xxxx
LOS by Move: A * C * B *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Shared Queue: 0.3 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Shrd StpDel: 8.4 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Shared LOS: A * * * * *
ApproachDel: xxxxxx 13.7 B
ApproachLOS: xxxxxx

Level of Service Computer Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM

Intersection #21: Austin/Moffat/SR-99 SB On



Lanes: 58***

Initial Vol: 58

Signal-Stop Right-Include

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Volume Module: >> Count Date: 1 Jan 2000 << Lifestyle

Base Vol: 58 60 8 36 49 257 94 138 32 1 1 1 6

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 58 60 8 36 49 257 94 138 32 1 1 1 6

Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0

PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0

Initial Fut: 58 60 8 36 49 257 94 138 32 1 1 1 6

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 58 60 8 36 49 257 94 138 32 1 1 1 6

Reduc Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 58 60 8 36 49 257 94 138 32 1 1 1 6

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Vol: 58 60 8 36 49 257 94 138 32 1 1 1 6

Saturation Flow Module:

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 0.49 0.51 1.00 0.11 0.14 0.75 0.36 0.52 0.12 0.12 0.13 0.75

Final Sat: 293 304 708 82 112 587 243 357 83 81 81 485

Capacity Analysis Module:

Vol/Sat: 0.20 0.20 0.01 0.44 0.44 0.44 0.39 0.39 0.39 0.01 0.01 0.01

Crit Moves: ****

Delay/Veh: 9.8 9.8 7.5 10.7 10.7 10.7 10.8 10.8 10.8 8.0 8.0 8.0

Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

AdjDel/Veh: 9.8 9.8 7.5 10.7 10.7 10.7 10.8 10.8 10.8 8.0 8.0 8.0

LOS by Move: A A A B B B B A A A A

ApproachDel: 9.6 10.7 10.8

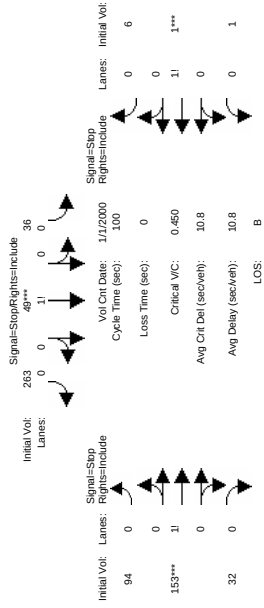
Delay Adj: 1.00 1.00 1.00

ApprAdjDel: 9.6 10.7 10.8

LOS by Appr: A B B A

Level of Service Computer Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Project AM

Intersection #21: Austin/Moffat/SR-99 SB On



Lanes: 58***

Initial Vol: 58

Signal-Stop Right-Include

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Volume Module: >> Count Date: 1 Jan 2000 << Lifestyle

Base Vol: 58 60 8 36 49 257 94 138 32 1 1 1 6

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 58 60 8 36 49 257 94 138 32 1 1 1 6

Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0

PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0

Initial Fut: 58 60 8 36 49 263 94 153 32 1 1 1 6

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 58 60 8 36 49 263 94 153 32 1 1 1 6

Reduc Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 58 60 8 36 49 263 94 153 32 1 1 1 6

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Vol: 58 60 8 36 49 263 94 153 32 1 1 1 6

Saturation Flow Module:

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 0.49 0.51 1.00 0.10 0.14 0.76 0.34 0.55 0.11 0.12 0.13 0.75

Final Sat: 290 300 699 80 109 584 229 373 78 80 80 479

Capacity Analysis Module:

Vol/Sat: 0.20 0.20 0.01 0.45 0.45 0.45 0.41 0.41 0.41 0.01 0.01 0.01

Crit Moves: ****

Delay/Veh: 9.9 9.9 7.6 10.9 10.9 10.9 11.2 11.2 11.2 8.0 8.0 8.0

Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

AdjDel/Veh: 9.9 9.9 7.6 10.9 10.9 10.9 11.2 11.2 11.2 8.0 8.0 8.0

LOS by Move: A A A B B B B A A A A

ApproachDel: 9.7 10.9 11.2

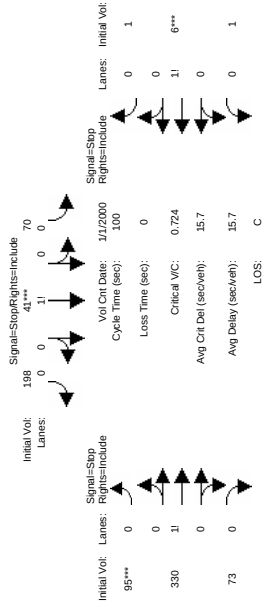
Delay Adj: 1.00 1.00 1.00

ApprAdjDel: 9.7 10.9 11.2

LOS by Appr: A B B A

Level of Service Computer Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing PM

Intersection #21: Austin/Moffat/SR-99 SB On



Lanes: 52 0 1 0 0 0 1
Initial Vol: 84*** 23

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Volume Module: >> Count Date: 1 Jan 2000 << Lifestyle

Base Vol: 52 84 23 70 41 198 95 330 73 1 6 1

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 52 84 23 70 41 198 95 330 73 1 6 1

Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0

PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0

Initial Fut: 52 84 23 70 41 198 95 330 73 1 6 1

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 52 84 23 70 41 198 95 330 73 1 6 1

Reduc Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 52 84 23 70 41 198 95 330 73 1 6 1

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Vol: 52 84 23 70 41 198 95 330 73 1 6 1

Saturation Flow Module:

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 0.38 0.62 1.00 0.23 0.13 0.64 0.19 0.66 0.15 0.12 0.75 0.13

Final Sat: 199 322 600 147 86 415 131 456 101 67 401 67

Capacity Analysis Module:

Vol/Sat: 0.26 0.26 0.04 0.48 0.48 0.48 0.72 0.72 0.72 0.01 0.01 0.01

Crit Moves: 11.2 11.2 8.4 12.5 12.5 12.5 19.4 19.4 19.4 9.0 9.0 9.0

Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

AdjDel/Veh: 11.2 11.2 8.4 12.5 12.5 12.5 19.4 19.4 19.4 9.0 9.0 9.0

LOS by Move: B B A B B C C C A A A

ApproachDel: 10.8 12.5 19.4 19.4 19.4 19.4 9.0 9.0 9.0 9.0 9.0

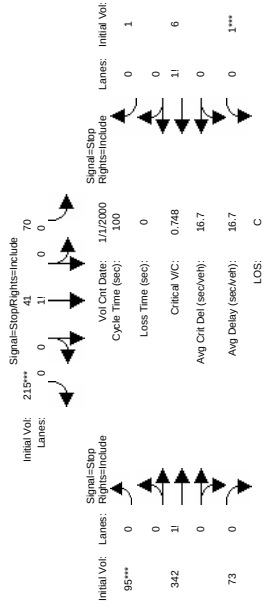
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

ApprAdjDel: 10.8 12.5 19.4 19.4 19.4 19.4 9.0 9.0 9.0 9.0 9.0

LOS by Appr: B B C A A A

Level of Service Computer Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Project PM

Intersection #21: Austin/Moffat/SR-99 SB On



Lanes: 52 0 1 0 0 0 1
Initial Vol: 84*** 23

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Volume Module: >> Count Date: 1 Jan 2000 << Lifestyle

Base Vol: 52 84 23 70 41 198 95 330 73 1 6 1

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 52 84 23 70 41 198 95 330 73 1 6 1

Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0

PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0

Initial Fut: 52 84 23 70 41 215 95 342 73 1 6 1

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 52 84 23 70 41 215 95 342 73 1 6 1

Reduc Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 52 84 23 70 41 215 95 342 73 1 6 1

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Vol: 52 84 23 70 41 215 95 342 73 1 6 1

Saturation Flow Module:

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 0.38 0.62 1.00 0.21 0.13 0.66 0.19 0.67 0.14 0.12 0.75 0.13

Final Sat: 197 318 590 139 81 425 127 457 98 65 393 65

Capacity Analysis Module:

Vol/Sat: 0.26 0.26 0.04 0.51 0.51 0.51 0.75 0.75 0.75 0.02 0.02 0.02

Crit Moves: 11.3 11.3 8.5 13.1 13.1 13.1 20.9 20.9 20.9 9.1 9.1 9.1

Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

AdjDel/Veh: 11.3 11.3 8.5 13.1 13.1 13.1 20.9 20.9 20.9 9.1 9.1 9.1

LOS by Move: B B A B B C C C A A A

ApproachDel: 10.9 12.5 19.4 19.4 19.4 19.4 9.1 9.1 9.1 9.1 9.1

Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

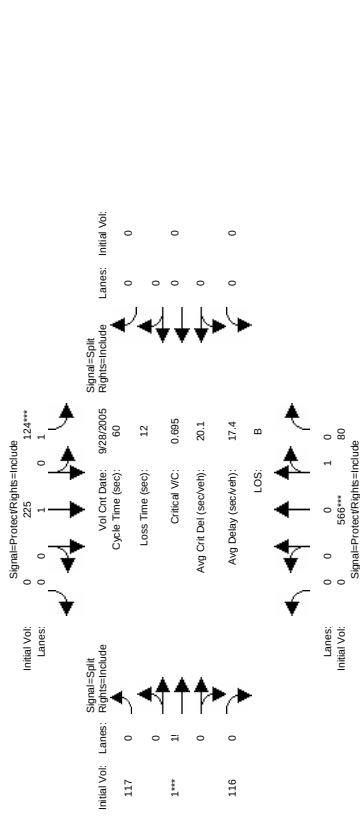
ApprAdjDel: 10.9 12.5 19.4 19.4 19.4 19.4 9.1 9.1 9.1 9.1 9.1

LOS by Appr: B B C A A A

PROJECT MITIGATION

Level of Service Computer Report
2000 HCM Operations (Future Volume Alternative)
Project Mitigation AM

Intersection #5: Airport/SR-120 EB

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 10 10 7 10 0 10 10 10 0 0 0

Volume Module: >> Count Date: 28 Sep 2005 <<

Base Vol:	0 363 80 124 216 0 117 1 38 0 0 0 0
Growth Adj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:	0 363 80 124 216 0 117 1 38 0 0 0 0
Added Vol:	0 203 0 0 0 0 0 0 78 0 0 0 0
PasserByVol:	0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut:	0 566 80 124 225 0 117 1 116 0 0 0 0
User Adj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:	0 566 80 124 225 0 117 1 116 0 0 0 0
Reduced Vol:	0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:	0 566 80 124 225 0 117 1 116 0 0 0 0
PCE Adj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol:	0 566 80 124 225 0 117 1 116 0 0 0 0

Saturation Flow Module:

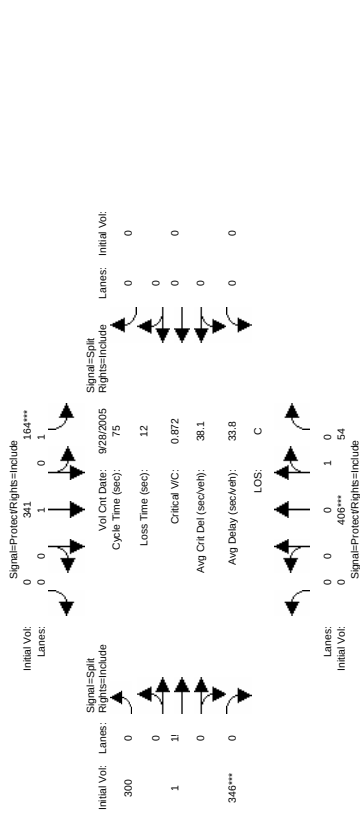
Sat/Lane:	1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:	1.00 0.98 0.98 0.95 1.00 1.00 0.87 0.87 0.87 1.00 1.00 1.00
Lanes:	0.00 0.88 0.12 1.00 1.00 0.00 0.50 0.01 0.49 0.00 0.00 0.00
Final Sat:	0 1636 231 1905 1900 0 827 7 820 0 0 0 0

Capacity Analysis Module:

Vol/Sat:	0.00 0.35 0.35 0.07 0.12 0.00 0.14 0.14 0.14 0.00 0.00 0.00
Crit Moves:	0.00 29.1 29.1 7.0 36.1 0.0 11.9 11.9 11.9 0.0 0.0 0.0
Green Time:	0.00 0.71 0.71 0.59 0.20 0.00 0.71 0.71 0.71 0.00 0.00 0.00
Volume/Cap:	0.00 12.2 12.2 25.1 5.4 0.0 22.5 22.5 22.5 0.0 0.0 0.0
Uniform Del:	0.0 2.7 2.7 4.3 0.1 0.0 7.2 7.2 7.2 0.0 0.0 0.0
IncrementDel:	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
InitQueueDel:	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj:	0.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 0.00 0.00 0.00
Delay/Veh:	0.0 14.9 14.9 29.5 5.5 0.0 29.7 29.7 29.7 0.0 0.0 0.0
User DelAdj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:	0.0 14.9 14.9 29.5 5.5 0.0 29.7 29.7 29.7 0.0 0.0 0.0
HCM2kAvg:	0 11 11 3 2 0 6 6 6 0 0 0

Level of Service Computer Report
2000 HCM Operations (Future Volume Alternative)
Project Mitigation PM

Intersection #5: Airport/SR-120 EB

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 10 10 7 10 0 10 10 10 0 0 0

Volume Module: >> Count Date: 28 Sep 2005 <<

Base Vol:	0 249 54 164 317 0 300 1 138 0 0 0 0
Growth Adj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:	0 249 54 164 317 0 300 1 138 0 0 0 0
Added Vol:	0 157 0 0 0 0 0 0 208 0 0 0 0
PasserByVol:	0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut:	0 406 54 164 341 0 300 1 346 0 0 0 0
User Adj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:	0 406 54 164 341 0 300 1 346 0 0 0 0
Reduced Vol:	0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:	0 406 54 164 341 0 300 1 346 0 0 0 0
PCE Adj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol:	0 406 54 164 341 0 300 1 346 0 0 0 0

Saturation Flow Module:

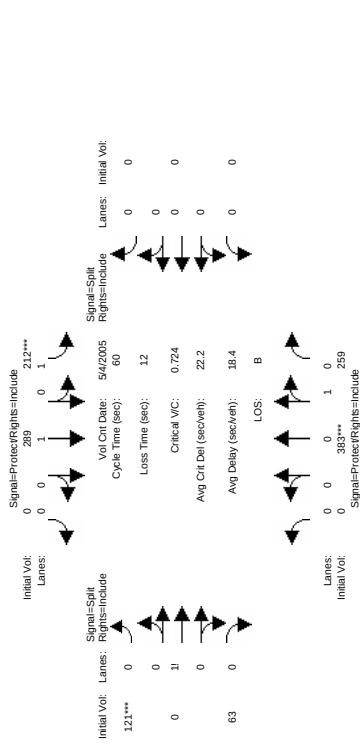
Sat/Lane:	1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:	1.00 0.98 0.98 0.95 1.00 1.00 0.86 0.86 0.86 1.00 1.00 1.00
Lanes:	0.00 0.88 0.12 1.00 1.00 0.00 0.46 0.01 0.53 0.00 0.00 0.00
Final Sat:	0 1650 219 1905 1900 0 759 3 875 0 0 0 0

Capacity Analysis Module:

Vol/Sat:	0.00 0.25 0.25 0.09 0.18 0.00 0.40 0.40 0.40 0.00 0.00 0.00
Crit Moves:	0.00 21.2 21.2 7.8 29.0 0.0 34.0 34.0 34.0 0.0 0.0 0.0
Green Time:	0.00 0.87 0.87 0.87 0.46 0.00 0.87 0.87 0.87 0.00 0.00 0.00
Volume/Cap:	0.00 25.6 25.6 33.1 17.2 0.0 18.5 18.5 18.5 0.0 0.0 0.0
Uniform Del:	0.0 25.6 25.6 32.9 6.5 0.0 11.0 11.0 11.0 0.0 0.0 0.0
IncrementDel:	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
InitQueueDel:	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj:	0.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 0.00 0.00 0.00
Delay/Veh:	0.0 40.3 40.3 66.0 17.7 0.0 29.5 29.5 29.5 0.0 0.0 0.0
User DelAdj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:	0.0 40.3 40.3 66.0 17.7 0.0 29.5 29.5 29.5 0.0 0.0 0.0
HCM2kAvg:	0 14 14 7 6 0 18 18 18 0 0 0

Level of Service Computer Report
2000 HCM Operations (Future Volume Alternative)
Project Mitigation AM

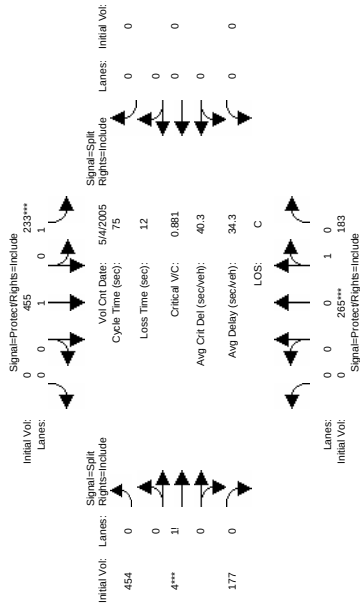
Intersection #15: Union/SR-120 EB



Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Min. Green:	0 10 10	7 10 0	10 10 10	0 0 0
Volume Module: >> Count Date: 4 May 2005 <<				
Base Vol:	0 236 31	212 181 0	121 0 11	0 0 0
Growth Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Initial Bse:	0 236 31	212 181 0	121 0 11	0 0 0
Added Vol:	0 147 228	0 108 0	0 0 52	0 0 0
PasserByVol:	0 0 0	0 0 0	0 0 0	0 0 0
Initial Fut:	0 383 259	212 289 0	121 0 63	0 0 0
User Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Volume:	0 383 259	212 289 0	121 0 63	0 0 0
Reduced Vol:	0 0 0	0 0 0	0 0 0	0 0 0
Reduced Vol:	0 383 259	212 289 0	121 0 63	0 0 0
PCE Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
MLF Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Final Vol:	0 383 259	212 289 0	121 0 63	0 0 0
Saturation Flow Module:				
Sat/Lane:	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900
Adjustment:	1.00 0.95 0.95	0.95 1.00 1.00	0.92 1.00 0.92	1.00 1.00 1.00
Lanes:	0.00 0.60 0.40	1.00 1.00 0.00	0.66 0.00 0.34	0.00 0.00 0.00
Final Sat:	0 1072 725	1905 1900 0	1154 0 601	0 0 0
Capacity Analysis Module:				
Vol/Sat:	0.00 0.36 0.36	0.12 0.15 0.00	0.10 0.00 0.10	0.00 0.00 0.00
Crit Moves:	0.00 0.36 0.36	0.12 0.15 0.00	0.10 0.00 0.10	0.00 0.00 0.00
Green Time:	0.00 28.6 28.6	9.4 38.0 0.0	10.0 0.0 10.0	0.0 0.0 0.0
Volume/Cap:	0.00 0.75 0.75	0.75 0.24 0.00	0.63 0.00 0.63	0.00 0.00 0.00
Uniform Del:	0.00 12.8 12.8	24.2 4.8 0.0	23.3 0.0 23.3	0.0 0.0 0.0
Incremental Del:	0.00 3.7 3.7	10.6 0.1 0.0	4.3 0.0 4.3	0.0 0.0 0.0
Initial Queue Del:	0.00 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0
Delay Adj:	0.00 1.00 1.00	1.00 1.00 0.00	1.00 0.00 1.00	0.00 0.00 0.00
Delay/Veh:	0.00 16.5 16.5	34.8 4.9 0.0	27.6 0.0 27.6	0.0 0.0 0.0
User Del Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Adj Del/Veh:	0.00 16.5 16.5	34.8 4.9 0.0	27.6 0.0 27.6	0.0 0.0 0.0
HCM2kAvg:	0 11 11	6 2 0	4 0 4	0 0 0

Level of Service Computer Report
2000 HCM Operations (Future Volume Alternative)
Project Mitigation PM

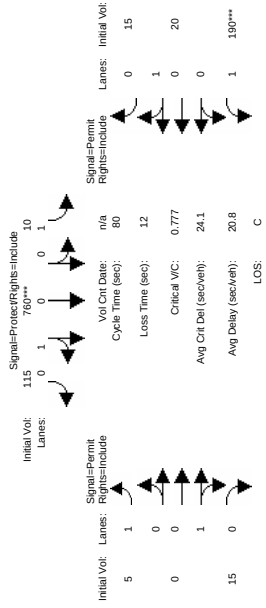
Intersection #15: Union/SR-120 EB



Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Min. Green:	0 10 10	7 10 0	10 10 10	0 0 0
Volume Module: >> Count Date: 4 May 2005 <<				
Base Vol:	0 152 7	233 166 0	454 4 38	0 0 0
Growth Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Initial Bse:	0 152 7	233 166 0	454 4 38	0 0 0
Added Vol:	0 113 176	0 289 0	0 0 139	0 0 0
PasserByVol:	0 0 0	0 0 0	0 0 0	0 0 0
Initial Fut:	0 265 183	233 455 0	454 4 177	0 0 0
User Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Volume:	0 265 183	233 455 0	454 4 177	0 0 0
Reduced Vol:	0 0 0	0 0 0	0 0 0	0 0 0
Reduced Vol:	0 265 183	233 455 0	454 4 177	0 0 0
PCE Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
MLF Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Final Vol:	0 265 183	233 455 0	454 4 177	0 0 0
Saturation Flow Module:				
Sat/Lane:	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900
Adjustment:	1.00 0.95 0.95	0.95 1.00 1.00	0.93 0.93 0.93	1.00 1.00 1.00
Lanes:	0.00 0.59 0.41	1.00 1.00 0.00	0.71 0.01 0.28	0.00 0.00 0.00
Final Sat:	0 1062 733	1905 1900 0	1257 11 490	0 0 0
Capacity Analysis Module:				
Vol/Sat:	0.00 0.25 0.25	0.13 0.24 0.00	0.36 0.36 0.36	0.00 0.00 0.00
Crit Moves:	0.00 0.25 0.25	0.13 0.24 0.00	0.36 0.36 0.36	0.00 0.00 0.00
Green Time:	0.00 21.2 21.2	11.0 32.2 0.0	30.8 30.8 30.8	0.0 0.0 0.0
Volume/Cap:	0.00 0.88 0.88	0.88 0.56 0.00	0.88 0.88 0.88	0.00 0.00 0.00
Uniform Del:	0.00 25.7 25.7	31.4 16.0 0.0	20.4 20.4 20.4	0.0 0.0 0.0
Incremental Del:	0.00 16.2 16.2	27.0 9.9 0.0	12.2 12.2 12.2	0.0 0.0 0.0
Initial Queue Del:	0.00 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0
Delay Adj:	0.00 1.00 1.00	1.00 1.00 0.00	1.00 1.00 1.00	0.00 0.00 0.00
Delay/Veh:	0.00 41.9 41.9	58.4 16.9 0.0	32.6 32.6 32.6	0.0 0.0 0.0
User Del Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Adj Del/Veh:	0.00 41.9 41.9	58.4 16.9 0.0	32.6 32.6 32.6	0.0 0.0 0.0
HCM2kAvg:	0 14 14	9 8 0	18 18 18	0 0 0

**CUMULATIVE NO PROJECT AND
CUMULATIVE WITH PROJECT CONDITIONS**

Intersection #3: Airport/Daniels



Initial Vol: 115
Lanes: 1 0 0 0 1 10
Signal-Protect/Right=include
769***

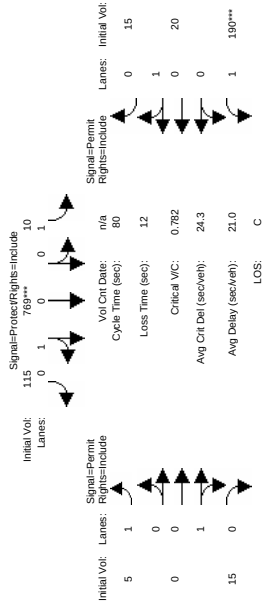
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 10 7 10 10 10 10 10 10 10 10

Volume Module:
Base Vol: 105 615 95 10 760 115 5 0 15 190 20 15
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 105 615 95 10 760 115 5 0 15 190 20 15
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 105 615 95 10 760 115 5 0 15 190 20 15
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 105 615 95 10 760 115 5 0 15 190 20 15
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 105 615 95 10 760 115 5 0 15 190 20 15
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 105 615 95 10 760 115 5 0 15 190 20 15

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.98 0.98 0.95 0.98 0.98 0.74 1.00 0.85 0.76 0.94 0.94
Lanes: 1.00 0.87 0.13 1.00 0.87 0.13 1.00 0.00 1.00 1.00 0.57 0.43
Final Sat: 1895 1613 249 1895 1617 245 1404 0 1615 1436 1016 762

Capacity Analysis Module:
Vol/Sat: 0.06 0.38 0.38 0.01 0.47 0.47 0.00 0.00 0.01 0.13 0.02 0.02
Crit Moves: ****
Green Time: 7.0 44.4 44.4 10.2 47.6 47.6 13.4 0.0 13.4 13.4 13.4 13.4
Volume/Cap: 0.66 0.69 0.69 0.04 0.79 0.79 0.02 0.00 0.06 0.79 0.12 0.12
Uniform Del: 35.4 12.8 12.8 30.6 12.4 12.4 27.8 0.0 28.0 31.9 28.3 28.3
IncrementDel: 10.2 2.0 2.0 0.1 3.9 3.9 0.0 0.0 0.1 16.0 0.2 0.2
InitQueueDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 1.00
Delay/Veh: 45.6 14.8 14.8 30.7 16.3 16.3 27.9 0.0 28.1 49.0 28.5 28.5
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 45.6 14.8 14.8 30.7 16.3 16.3 27.9 0.0 28.1 49.0 28.5 28.5
HCM2kAvg: 3 13 13 0 17 17 0 0 0 6 1 1

Intersection #3: Airport/Daniels



Initial Vol: 115
Lanes: 1 0 0 0 1 10
Signal-Protect/Right=include
769***

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 10 7 10 10 10 10 10 10 10 10

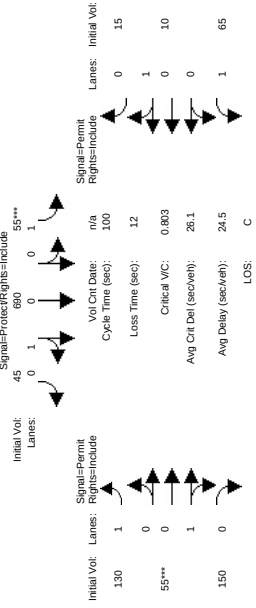
Volume Module:
Base Vol: 105 615 95 10 760 115 5 0 15 190 20 15
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 105 615 95 10 760 115 5 0 15 190 20 15
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 105 636 95 10 769 115 5 0 15 190 20 15
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 105 636 95 10 769 115 5 0 15 190 20 15
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 105 636 95 10 769 115 5 0 15 190 20 15
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 105 636 95 10 769 115 5 0 15 190 20 15

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.98 0.98 0.95 0.98 0.98 0.74 1.00 0.85 0.76 0.94 0.94
Lanes: 1.00 0.87 0.13 1.00 0.87 0.13 1.00 0.00 1.00 1.00 0.57 0.43
Final Sat: 1895 1622 242 1895 1621 242 1404 0 1615 1436 1016 762

Capacity Analysis Module:
Vol/Sat: 0.06 0.39 0.39 0.01 0.47 0.47 0.00 0.00 0.01 0.13 0.02 0.02
Crit Moves: ****
Green Time: 7.0 44.7 44.7 10.0 47.7 47.7 13.3 0.0 13.3 13.3 13.3 13.3
Volume/Cap: 0.66 0.70 0.70 0.04 0.80 0.80 0.02 0.00 0.06 0.80 0.12 0.12
Uniform Del: 35.4 12.8 12.8 30.8 12.4 12.4 27.9 0.0 28.1 32.0 28.4 28.4
IncrementDel: 10.2 2.2 2.2 0.1 4.1 4.1 0.0 0.0 0.1 16.7 0.2 0.2
InitQueueDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.00 1.00 1.00 1.00 1.00
Delay/Veh: 45.6 15.0 15.0 30.9 16.5 16.5 27.9 0.0 28.2 49.8 28.5 28.5
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 45.6 15.0 15.0 30.9 16.5 16.5 27.9 0.0 28.2 49.8 28.5 28.5
HCM2kAvg: 3 13 13 0 17 17 0 0 0 6 1 1

Level Of Service Computer Report
2000 HCM Operations (Future Volume Alternative)
Cumulative No Project PM

Intersection #3: Airport/Daniels



Initial Vol: 130 1
Lanes: 1
Signal-Protect/Right=include
Initial Vol: 45 60 55***
Lanes: 1 0 0 1
Signal-Protect/Right=include
Initial Vol: 150 0
Lanes: 0
Signal-Protect/Right=include
Initial Vol: 150 0
Lanes: 0
Signal-Protect/Right=include

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 10 7 10 10 10 10 10 10 10 10

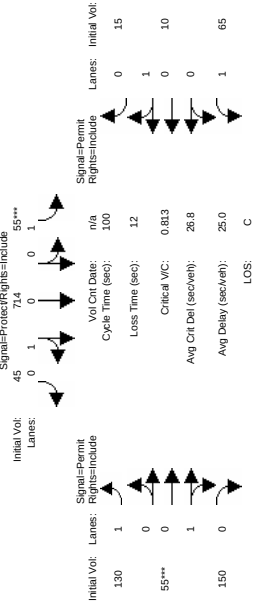
Volume Module:
Base Vol: 45 870 160 55 690 45 130 55 150 65 10 15
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 45 870 160 55 690 45 130 55 150 65 10 15
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 45 870 160 55 690 45 130 55 150 65 10 15
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 45 870 160 55 690 45 130 55 150 65 10 15
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 45 870 160 55 690 45 130 55 150 65 10 15
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 45 870 160 55 690 45 130 55 150 65 10 15

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.98 0.98 0.95 0.99 0.99 0.75 0.89 0.89 0.32 0.91 0.91
Lanes: 1.00 0.84 0.16 1.00 0.94 0.06 1.00 0.27 0.73 1.00 0.40 0.60
Final Sat: 1895 1568 288 1895 1768 115 1421 454 1237 614 692 1037

Capacity Analysis Module:
Vol/Sat: 0.62 0.55 0.55 0.03 0.39 0.39 0.09 0.12 0.12 0.11 0.01 0.01
Crit Moves: 11.2 66.5 66.5 7.0 62.3 62.3 14.5 14.5 14.5 14.5 14.5 14.5
Green Time: 0.22 0.83 0.83 0.44 0.63 0.63 0.63 0.83 0.83 0.73 0.10 0.10
Volume/Cap: 41.0 17.7 17.7 47.0 12.7 12.7 46.3 62.8 62.8 66.9 37.2 37.2
Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
User DelAdj: 41.0 17.7 17.7 47.0 12.7 12.7 46.3 62.8 62.8 66.9 37.2 37.2
AdjDel/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
HCM2Kavg: 1 24 24 2 14 14 6 9 9 6 1 1

Level Of Service Computer Report
2000 HCM Operations (Future Volume Alternative)
Cumulative Project PM

Intersection #3: Airport/Daniels



Initial Vol: 130 1
Lanes: 1
Signal-Protect/Right=include
Initial Vol: 45 714 55***
Lanes: 1 0 0 1
Signal-Protect/Right=include
Initial Vol: 150 0
Lanes: 0
Signal-Protect/Right=include
Initial Vol: 150 0
Lanes: 0
Signal-Protect/Right=include

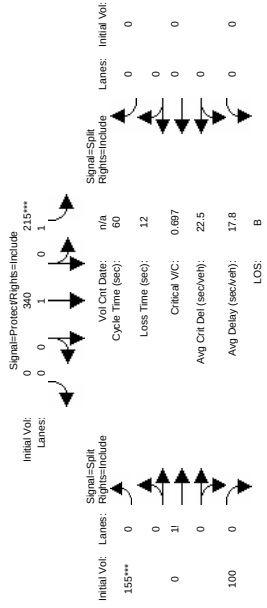
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 10 7 10 10 10 10 10 10 10 10

Volume Module:
Base Vol: 45 870 160 55 690 45 130 55 150 65 10 15
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 45 870 160 55 690 45 130 55 150 65 10 15
Added Vol: 0 16 0 0 24 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 45 886 160 55 714 45 130 55 150 65 10 15
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 45 886 160 55 714 45 130 55 150 65 10 15
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 45 886 160 55 714 45 130 55 150 65 10 15
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 45 886 160 55 714 45 130 55 150 65 10 15

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.98 0.98 0.95 0.99 0.99 0.75 0.89 0.89 0.32 0.91 0.91
Lanes: 1.00 0.85 0.15 1.00 0.94 0.06 1.00 0.27 0.73 1.00 0.40 0.60
Final Sat: 1895 1572 284 1895 1771 112 1421 454 1237 604 692 1037

Capacity Analysis Module:
Vol/Sat: 0.62 0.56 0.56 0.03 0.40 0.40 0.09 0.12 0.12 0.11 0.01 0.01
Crit Moves: 10.9 66.7 66.7 7.0 62.8 62.8 14.3 14.3 14.3 14.3 14.3 14.3
Green Time: 0.23 0.85 0.85 0.44 0.64 0.64 0.64 0.85 0.85 0.75 0.10 0.10
Volume/Cap: 41.3 18.3 18.3 47.0 12.8 12.8 47.0 64.7 64.7 71.1 37.4 37.4
Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
User DelAdj: 41.3 18.3 18.3 47.0 12.8 12.8 47.0 64.7 64.7 71.1 37.4 37.4
AdjDel/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
HCM2Kavg: 1 24 24 2 14 14 6 9 9 6 1 1

Intersection #5: Airport/SR-120 EB



Lanes: 0 0 1 0 1
Initial Vol: 0 0 555*** 125

Signal-Protect/Right-Include

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Min. Green:	0 10 10	7 10 0	10 10 10	0 0 0

Volume Module:

Base Vol:	0 555 125 215 340	0 155 0 100 0 100 0 0 0 0
Growth Adj:	1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:	0 555 125 215 340	0 155 0 100 0 100 0 0 0 0
Added Vol:	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
PasserByVol:	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
Initial Fut:	0 555 125 215 340	0 155 0 100 0 100 0 0 0 0
User Adj:	1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:	1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:	0 555 125 215 340	0 155 0 100 0 100 0 0 0 0
Reduced Vol:	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
Reduced Vol:	0 555 125 215 340	0 155 0 100 0 100 0 0 0 0
PCE Adj:	1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:	1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol:	0 555 125 215 340	0 155 0 100 0 100 0 0 0 0

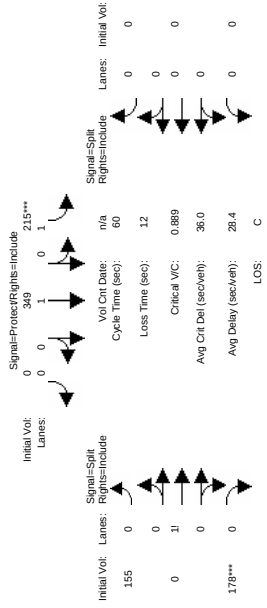
Saturation Flow Module:

Sat/Lane:	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900
Adjustment:	1.00 1.00 0.85	0.95 1.00 1.00	0.92 1.00 0.92	1.00 1.00 1.00
Lanes:	0.00 1.00 1.00	1.00 1.00 0.00	0.61 0.00 0.39	0.00 0.00 0.00
Final Sat:	0 1900 1615	1905 1900 0	1061 0 684	0 0 0

Capacity Analysis Module:

Vol/Sat:	0.00 0.29 0.08	0.12 0.18 0.00	0.15 0.00 0.15	0.00 0.00 0.00
Crit Moves:	0.00 0.29 0.08	0.12 0.18 0.00	0.15 0.00 0.15	0.00 0.00 0.00
Green Time:	0.00 25.2 25.2	10.3 35.4 0.0	12.6 0.0 12.6	0.0 0.0 0.0
Volume/Cap:	0.00 0.70 0.18	0.70 0.30 0.00	0.70 0.00 0.70	0.00 0.00 0.00
Uniform Del:	0.0 14.3 11.0	23.4 6.1 0.0	21.9 0.0 21.9	0.0 0.0 0.0
IncrementDel:	0.0 2.7 0.1	6.8 0.2 0.0	5.8 0.0 5.8	0.0 0.0 0.0
InitQueueDel:	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0
Delay Adj:	0.00 17.0 11.1	30.2 6.3 0.0	27.7 0.0 27.7	0.0 0.0 0.0
User DelAdj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
AdjDel/Veh:	0.0 17.0 11.1	30.2 6.3 0.0	27.7 0.0 27.7	0.0 0.0 0.0
HCN2kAvg:	0 8 1	4 3 0	6 6 6	0 0 0

Intersection #5: Airport/SR-120 EB



Lanes: 0 0 1 0 1
Initial Vol: 0 0 758*** 125

Signal-Protect/Right-Include

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Min. Green:	0 10 10	7 10 0	10 10 10	0 0 0

Volume Module:

Base Vol:	0 555 125 215 340	0 155 0 100 0 100 0 0 0 0
Growth Adj:	1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:	0 555 125 215 340	0 155 0 100 0 100 0 0 0 0
Added Vol:	0 203 0 0 0 0 0 0 0 0	0 78 0 0 0 0 0 0 0 0
PasserByVol:	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
Initial Fut:	0 758 125 215 340	0 155 0 100 0 100 0 0 0 0
User Adj:	1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:	1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:	0 758 125 215 340	0 155 0 100 0 100 0 0 0 0
Reduced Vol:	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
Reduced Vol:	0 758 125 215 340	0 155 0 100 0 100 0 0 0 0
PCE Adj:	1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:	1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol:	0 758 125 215 340	0 155 0 100 0 100 0 0 0 0

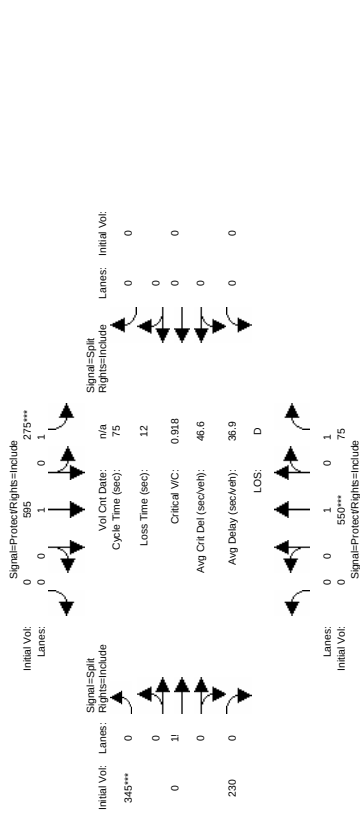
Saturation Flow Module:

Sat/Lane:	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900
Adjustment:	1.00 1.00 0.85	0.95 1.00 1.00	0.91 1.00 0.91	1.00 1.00 1.00
Lanes:	0.00 1.00 1.00	1.00 1.00 0.00	0.47 0.00 0.53	0.00 0.00 0.00
Final Sat:	0 1900 1615	1905 1900 0	802 0 921	0 0 0

Capacity Analysis Module:

Vol/Sat:	0.00 0.40 0.08	0.12 0.18 0.00	0.19 0.00 0.19	0.00 0.00 0.00
Crit Moves:	0.00 0.40 0.08	0.12 0.18 0.00	0.19 0.00 0.19	0.00 0.00 0.00
Green Time:	0.0 26.9 26.9	8.0 35.0 0.0	13.0 0.0 13.0	0.0 0.0 0.0
Volume/Cap:	0.00 0.89 0.17	0.89 0.32 0.00	0.89 0.00 0.89	0.00 0.00 0.00
Uniform Del:	0.0 15.2 9.9	25.5 6.4 0.0	22.8 0.0 22.8	0.0 0.0 0.0
IncrementDel:	0.0 11.4 0.1	30.5 0.2 0.0	22.0 0.0 22.0	0.0 0.0 0.0
InitQueueDel:	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0
Delay Adj:	0.00 26.5 10.0	56.0 6.6 0.0	44.8 0.0 44.8	0.0 0.0 0.0
User DelAdj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
AdjDel/Veh:	0.0 26.5 10.0	56.0 6.6 0.0	44.8 0.0 44.8	0.0 0.0 0.0
HCN2kAvg:	0 14 1	4 3 0	10 10 0	0 0 0

Intersection #5: Airport/SR-120 EB



Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 10 10 7 10 0 10 10 10 0 0 0

Volume Module:

Base Vol:	0	550	75	275	595	0	345	0	230	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	550	75	275	595	0	345	0	230	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	550	75	275	595	0	345	0	230	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	550	75	275	595	0	345	0	230	0	0	0
Reduced Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	550	75	275	595	0	345	0	230	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	550	75	275	595	0	345	0	230	0	0	0

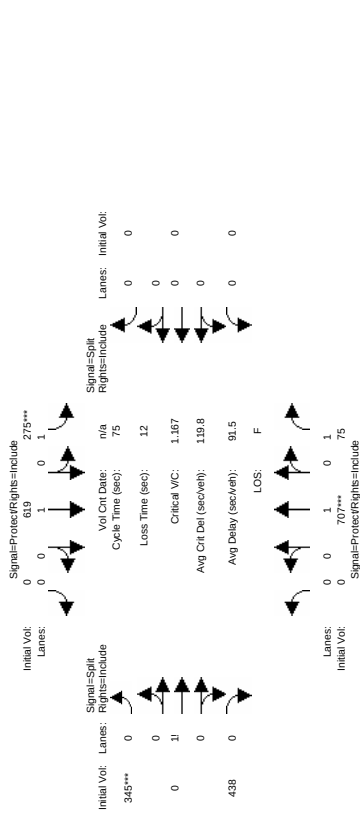
Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.95	1.00	1.00	0.92	1.00	0.92	1.00	1.00	1.00
Lanes:	0.00	1.00	1.00	0.00	1.00	1.00	0.60	0.00	0.40	0.00	0.00	0.00
Final Sat:	0	1900	1615	1905	1900	0	1047	0	698	0	0	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.29	0.05	0.15	0.31	0.00	0.33	0.00	0.33	0.00	0.00	0.00
Crit Moves:	0.00	0.29	0.05	0.15	0.31	0.00	0.33	0.00	0.33	0.00	0.00	0.00
Green Time:	0.0	23.6	23.6	12.4	36.1	0.0	26.9	0.0	26.9	0.0	0.0	0.0
Volume/Cap:	0.00	0.92	0.15	0.92	0.65	0.00	0.92	0.00	0.92	0.00	0.00	0.00
Delay/Veh:	0.0	44.0	18.6	62.3	16.4	0.0	41.6	0.0	41.6	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	44.0	18.6	62.3	16.4	0.0	41.6	0.0	41.6	0.0	0.0	0.0
HC2kAvg:	0	14	1	7	10	0	18	0	18	0	0	0

Intersection #5: Airport/SR-120 EB



Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 10 10 7 10 0 10 10 10 0 0 0

Volume Module:

Base Vol:	0	550	75	275	595	0	345	0	230	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	550	75	275	595	0	345	0	230	0	0	0
Added Vol:	0	157	0	0	24	0	0	0	208	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	707	75	275	619	0	345	0	438	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	707	75	275	619	0	345	0	438	0	0	0
Reduced Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	707	75	275	619	0	345	0	438	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	0	707	75	275	619	0	345	0	438	0	0	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.95	1.00	1.00	0.90	1.00	0.90	1.00	1.00	1.00
Lanes:	0.00	1.00	1.00	0.00	1.00	1.00	0.44	0.00	0.56	0.00	0.00	0.00
Final Sat:	0	1900	1615	1905	1900	0	757	0	961	0	0	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.37	0.05	0.15	0.33	0.00	0.46	0.00	0.46	0.00	0.00	0.00
Crit Moves:	0.00	0.37	0.05	0.15	0.33	0.00	0.46	0.00	0.46	0.00	0.00	0.00
Green Time:	0.0	23.9	23.9	9.8	33.7	0.0	29.3	0.0	29.3	0.0	0.0	0.0
Volume/Cap:	0.00	1.17	0.15	1.17	0.72	0.00	1.17	0.00	1.17	0.00	0.00	0.00
Delay/Veh:	0.0	117	18.4	143.7	20.0	0.0	113.4	0.0	113.4	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	117	18.4	143.7	20.0	0.0	113.4	0.0	113.4	0.0	0.0	0.0
HC2kAvg:	0	29	1	11	11	0	36	0	36	0	0	0

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Level of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

***** Intersection #9 Woodward/Oleander *****

***** Average Delay (sec/veh): 1.0 Worst Case Level of Service: A [9.3] *****

***** Approach: North Bound South Bound East Bound West Bound *****

***** Movement: L - T - R L - T - R L - T - R L - T - R *****

***** Control: Stop Sign Stop Sign Stop Sign Stop Sign *****

***** Rights: Include Include Include Include *****

***** Lanes: 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 *****

***** Volume Module: *****

Base Vol: 5 0 15 0 0 0 0 0 135 5 10 80 15

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 5 0 15 0 0 0 0 0 135 5 10 80 15

Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0

PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0

Initial Fut: 5 0 15 0 0 0 0 0 135 5 10 80 15

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 5 0 15 0 0 0 0 0 135 5 10 80 15

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Final Vol: 5 0 15 0 0 0 0 0 135 5 10 80 15

Critical Gap Module: *****

Critical Gap: 6.4 xxxxx 6.2 xxxxxx xxxxx xxxxx 4.1 xxxxx xxxxx

FollowUpTim: 3.5 xxxxx 3.3 xxxxxx xxxxx xxxxx 2.2 xxxxx xxxxx

***** Capacity Module: *****

Conflict Vol: 245 xxxxx 138 xxxxx xxxxx xxxxx xxxxx 140 xxxxx xxxxx

Potential Cap.: 748 xxxxx 916 xxxxx xxxxx xxxxx xxxxx 1456 xxxxx xxxxx

Move Cap.: 744 xxxxx 916 xxxxx xxxxx xxxxx xxxxx 1456 xxxxx xxxxx

Volume/Cap: 0.01 xxxxx 0.02 xxxxx xxxxx xxxxx xxxxx 0.01 xxxxx xxxxx

***** Level of Service Module: *****

Queue: xxxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 0.0 xxxxx xxxxx

Stopped Del: xxxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 7.5 xxxxx xxxxx

LOS by Move: A A A A A A A A A A A A

Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT

Shared Cap.: xxx 866 xxxxx 0 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

Shared Queue: xxxxx 0.1 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

Shrd Stpel: xxxxx 9.3 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

Shared LOS: A A A A A A A A A A A A

ApproachDel: 9.3 A A A A A A A A A A A A

ApproachLOS: A A A A A A A A A A A A

Level of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

***** Intersection #9 Woodward/Oleander *****

***** Average Delay (sec/veh): 7.7 Worst Case Level of Service: C [15.2] *****

***** Approach: North Bound South Bound East Bound West Bound *****

***** Movement: L - T - R L - T - R L - T - R L - T - R *****

***** Control: Stop Sign Stop Sign Stop Sign Stop Sign *****

***** Rights: Include Include Include Include *****

***** Lanes: 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 *****

***** Volume Module: *****

Base Vol: 5 0 15 0 0 0 0 0 135 5 10 80 15

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 5 0 15 0 0 0 0 0 135 5 10 80 15

Added Vol: 94 0 104 106 0 53 22 0 40 44 0 45

PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0

Initial Fut: 99 0 119 106 0 53 22 135 45 54 80 60

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 99 0 119 106 0 53 22 135 45 54 80 60

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Final Vol: 99 0 119 106 0 53 22 135 45 54 80 60

Critical Gap Module: *****

Critical Gap: 7.1 xxxxx 6.2 7.1 xxxxx 6.2 4.1 xxxxx xxxxx

FollowUpTim: 3.5 xxxxx 3.3 3.5 xxxxx 3.3 2.2 xxxxx xxxxx

***** Capacity Module: *****

Conflict Vol: 446 xxxxx 158 479 xxxxx 110 140 xxxxx xxxxx

Potential Cap.: 526 xxxxx 893 500 xxxxx 949 1456 xxxxx xxxxx

Move Cap.: 476 xxxxx 893 416 xxxxx 949 1456 xxxxx xxxxx

Volume/Cap: 0.21 xxxxx 0.13 0.26 xxxxx 0.06 0.02 xxxxx xxxxx

***** Level of Service Module: *****

Queue: xxxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 0.0 xxxxx xxxxx

Stopped Del: xxxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 7.5 xxxxx xxxxx

LOS by Move: A A A A A A A A A A A A

Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT

Shared Cap.: xxx 639 xxxxx xxxxx 511 xxxxx xxxxx xxxxx xxxxx

Shared Queue: xxxxx 1.5 xxxxx xxxxx 1.3 xxxxx xxxxx xxxxx xxxxx

Shrd Stpel: xxxxx 13.5 xxxxx xxxxx 15.2 xxxxx xxxxx xxxxx xxxxx

Shared LOS: B B C C C C C C C C C C

ApproachDel: 13.5 15.2 C C C C C C C C C C

ApproachLOS: B B C C C C C C C C C C

PM

Oleander/Sundance

Level of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
Intersection #9 Woodward/Oleander

Average Delay (sec/veh): 10.7 Worst Case Level of Service: B(11.5)

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Uncontrolled Uncontrolled Stop Sign Stop Sign

Rights: Include Include Include Include

Lanes: 0 1 1 0 0 1 0 0 0 0 0 1 0 0 1 0 0

Volume Module:

Base Vol: 5 0 10 50 0 0 0 195 5 10 160 10
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 5 0 10 50 0 0 0 195 5 10 160 10
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 5 0 10 50 0 0 0 195 5 10 160 10
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 5 0 10 50 0 0 0 195 5 10 160 10
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol.: 5 0 10 50 0 0 0 195 5 10 160 10

Critical Gap Module:
Critical Gap: 4.1 xxx xxxxxx 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxx xxxxxx 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Conflict Vol: 0 xxx xxxxxx 10 xxx xxxxxx xxx 120 0 213 115 5
Potential Cap.: 900 xxx xxxxxx 1623 xxx xxxxxx xxx 774 900 749 779 1084
Move Cap.: 900 xxx xxxxxx 1623 xxx xxxxxx xxx 746 900 579 751 1084
Volume/Cap: 0.01 xxx xxxxxx 0.03 xxx xxxxxx xxx 0.26 0.01 0.02 0.21 0.01

Level of Service Module:
Queue: 0.0 xxx xxxxxx 0.1 xxx xxxxxx xxx xxx xxx xxx
Stopped Del: 9.0 xxx xxxxxx 7.3 xxx xxxxxx xxx xxx xxx xxx
LOS by Move: A A A A A A A A A A A A
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxx xxx xxxxxx xxx xxx xxxxxx xxx 749 xxx 751 xxx
Shared Queue: xxx xxx xxxxxx xxx xxx xxxxxx xxx 1.1 xxx 0.9 xxx
Shrd StpDel: xxx xxx xxxxxx xxx xxx xxxxxx xxx 11.5 xxx 11.3 xxx
Shared LOS: A A A A A A A A A A A A
ApproachDel: xxxxxx xxxxxx 11.5 B 11.3 B
ApproachLOS: B B

PM

Oleander/Sundance

Level of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
Intersection #9 Woodward/Oleander

Average Delay (sec/veh): 63.5 Worst Case Level of Service: F(118.1)

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Uncontrolled Uncontrolled Stop Sign Stop Sign

Rights: Include Include Include Include

Lanes: 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0

Volume Module:

Base Vol: 5 0 10 50 0 0 0 195 5 10 160 10
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 5 0 10 50 0 0 0 195 5 10 160 10
Added Vol: 61 0 67 95 0 47 65 0 97 107 0 132
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 66 0 77 145 0 47 65 195 102 117 160 142
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 66 0 77 145 0 47 65 195 102 117 160 142
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol.: 66 0 77 145 0 47 65 195 102 117 160 142

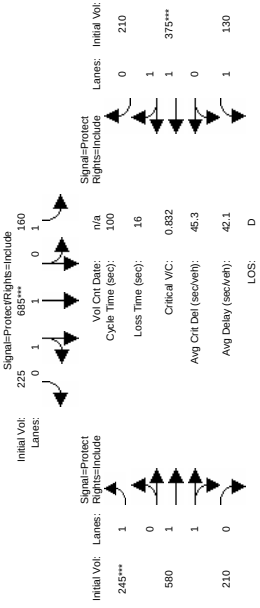
Critical Gap Module:
Critical Gap: 4.1 xxx xxxxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxx xxxxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Conflict Vol: 47 xxx xxxxxx 77 xxx xxxxxx 635 522 24 633 508 39
Potential Cap.: 1573 xxx xxxxxx 1535 xxx xxxxxx 394 462 1059 396 471 1039
Move Cap.: 1573 xxx xxxxxx 1535 xxx xxxxxx 211 396 1059 198 404 1039
Volume/Cap: 0.04 xxx xxxxxx 0.09 xxx xxxxxx 0.31 0.49 0.10 0.59 0.40 0.14

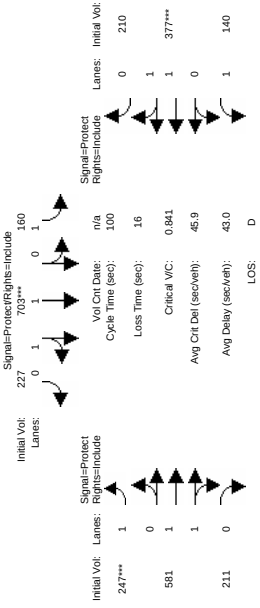
Level of Service Module:
Queue: 0.1 xxx xxxxxx 0.3 xxx xxxxxx xxx xxx xxx xxx
Stopped Del: 7.4 xxx xxxxxx 7.6 xxx xxxxxx xxx xxx xxx xxx
LOS by Move: A A A A A A A A A A A A
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxx xxx xxxxxx xxx xxx xxxxxx xxx 404 xxx 373 xxx
Shared Queue: xxx xxx xxxxxx xxx xxx xxxxxx xxx 9.3 xxx 15.8 xxx
Shrd StpDel: xxx xxx xxxxxx xxx xxx xxxxxx xxx 54.8 xxx 118 xxx
Shared LOS: F F F F F F F F F F F F
ApproachDel: xxxxxx xxxxxx 54.8 F 118.1 F
ApproachLOS: F F

Level of Service Computer Report
2000 HCM Operations (Future Volume Alternative)
Cumulative Project PM

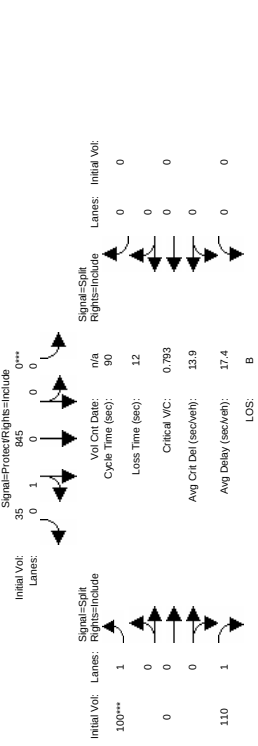
Intersection #11: Union/Yosemite

Initial Vol: 245*** 1
Lanes: 0
Signal-Protect/Right=include
Initial Vol: 225
Lanes: 0
Signal-Protect/Right=includeApproach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10Volume Module:
Base Vol: 235 885 100 160 685 225 245 580 210 130 375 210
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 235 885 100 160 685 225 245 580 210 130 375 210
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 235 885 100 160 685 225 245 580 210 130 375 210
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 235 885 100 160 685 225 245 580 210 130 375 210
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 235 885 100 160 685 225 245 580 210 130 375 210
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 235 885 100 160 685 225 245 580 210 130 375 210Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.94 0.94 0.95 0.91 0.91 0.95 0.91 0.91 0.95 0.90 0.90
Lanes: 1.00 1.80 0.20 1.00 1.51 0.49 1.00 1.47 0.53 1.00 1.28 0.72
Final Sat: 1805 3195 361 1805 2617 860 1805 2544 921 1805 2189 1226Capacity Analysis Module:
Vol/Sat: 0.13 0.28 0.28 0.09 0.26 0.26 0.14 0.23 0.23 0.07 0.17 0.17
Crit Moves: ****
Green Time: 15.6 35.7 35.7 11.4 31.5 31.5 16.3 28.0 28.0 8.9 20.6 20.6
Volume/Cap: 0.83 0.78 0.78 0.78 0.83 0.83 0.83 0.81 0.81 0.81 0.83 0.83
Delay/Veh: 59.5 31.7 31.7 59.8 37.4 37.4 58.4 38.8 38.8 70.9 46.4 46.4
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 59.5 31.7 31.7 59.8 37.4 37.4 58.4 38.8 38.8 70.9 46.4 46.4
HCM2Kavg: 7 13 13 7 15 15 8 11 11 5 9 9Level of Service Computer Report
2000 HCM Operations (Future Volume Alternative)
Cumulative Project PM

Intersection #11: Union/Yosemite

Initial Vol: 247*** 1
Lanes: 0
Signal-Protect/Right=include
Initial Vol: 227
Lanes: 0
Signal-Protect/Right=includeApproach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10Volume Module:
Base Vol: 235 885 100 160 685 225 245 580 210 130 375 210
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 235 885 100 160 685 225 245 580 210 130 375 210
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 235 897 106 160 703 227 247 581 211 140 377 210
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 235 897 106 160 703 227 247 581 211 140 377 210
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 235 897 106 160 703 227 247 581 211 140 377 210
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 235 897 106 160 703 227 247 581 211 140 377 210Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.93 0.93 0.95 0.91 0.91 0.95 0.91 0.91 0.95 0.90 0.90
Lanes: 1.00 1.79 0.21 1.00 1.51 0.49 1.00 1.47 0.53 1.00 1.28 0.72
Final Sat: 1805 3177 375 1805 2628 849 1805 2542 923 1805 2193 1222Capacity Analysis Module:
Vol/Sat: 0.13 0.28 0.28 0.09 0.27 0.27 0.14 0.23 0.23 0.08 0.17 0.17
Crit Moves: ****
Green Time: 15.5 36.0 36.0 11.3 31.8 31.8 16.3 27.4 27.4 9.3 20.4 20.4
Volume/Cap: 0.84 0.78 0.78 0.78 0.84 0.84 0.84 0.83 0.83 0.83 0.84 0.84
Delay/Veh: 60.9 31.8 31.8 61.0 37.7 37.7 59.7 40.6 40.6 73.2 47.3 47.3
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 60.9 31.8 31.8 61.0 37.7 37.7 59.7 40.6 40.6 73.2 47.3 47.3
HCM2Kavg: 7 13 13 7 16 16 8 12 12 5 9 9

Intersection #13: Union/Daniels



Initial Vol: 100+/- 1
Lanes: 0
Signal-Stage Rights-Include: 35 845 0+/-
Signal-Protect/Rights-Include: 0 1 0 0 0 0
Vol Cnt Date: n/a
Cycle Time (sec): 90
Loss Time (sec): 12
Critical VC: 0.793
Avg Cnt Del (sec/veh): 13.9
Avg Delay (sec/veh): 17.4
LOS: B

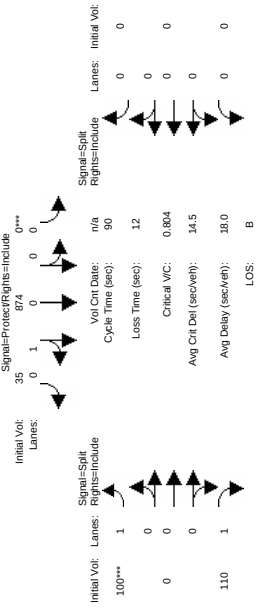
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 0 0 10 10 10 0 0 0 0

Volume Module:
Base Vol: 155 1200 0 0 845 35 100 0 110 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 155 1200 0 0 845 35 100 0 110 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 155 1200 0 0 845 35 100 0 110 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 155 1200 0 0 845 35 100 0 110 0 0 0
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 155 1200 0 0 845 35 100 0 110 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 155 1200 0 0 845 35 100 0 110 0 0 0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 1.00 0.95 1.00 1.00 0.85 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.00 0.00 0.00 0.96 0.04 1.00 0.00 1.00 0.00 0.00 0.00
Final Sat: 1895 1900 0 0 1815 75 1805 0 1615 0 0 0

Capacity Analysis Module:
Vol/Sat: 0.09 0.63 0.00 0.00 0.47 0.47 0.06 0.00 0.07 0.00 0.00 0.00
Crit Moves: 10.6 68.0 0.0 0.0 57.4 57.4 10.0 0.0 10.0 0.0 0.0 0.0
Green Time: 0.73 0.84 0.00 0.00 0.73 0.73 0.50 0.00 0.61 0.00 0.00 0.00
Volume/Cap: 50.4 11.7 0.0 0.0 13.3 13.3 39.6 0.0 44.3 0.0 0.0 0.0
Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
User DelAdj: 50.4 11.7 0.0 0.0 13.3 13.3 39.6 0.0 44.3 0.0 0.0 0.0
AdjDel/Veh: 4 21 0 0 15 15 3 0 3 0 0 0
HCM2kVg: 4 21 0 0 15 15 3 0 3 0 0 0

Intersection #13: Union/Daniels



Initial Vol: 100+/- 1
Lanes: 0
Signal-Stage Rights-Include: 35 874 0+/-
Signal-Protect/Rights-Include: 0 1 0 0 0 0
Vol Cnt Date: n/a
Cycle Time (sec): 90
Loss Time (sec): 12
Critical VC: 0.804
Avg Cnt Del (sec/veh): 14.5
Avg Delay (sec/veh): 18.0
LOS: B

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 0 0 10 10 10 0 0 0 0

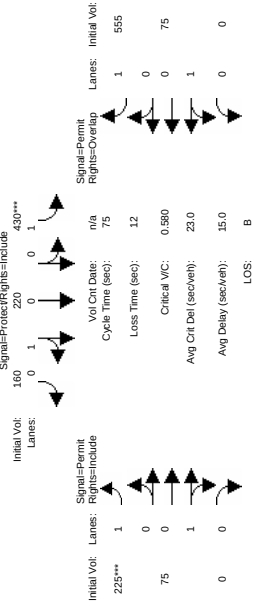
Volume Module:
Base Vol: 155 1200 0 0 845 35 100 0 110 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 155 1200 0 0 845 35 100 0 110 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 155 1219 0 0 874 35 100 0 110 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 155 1219 0 0 874 35 100 0 110 0 0 0
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 155 1219 0 0 874 35 100 0 110 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 155 1219 0 0 874 35 100 0 110 0 0 0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 1.00 1.00 0.95 1.00 1.00 0.85 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.00 0.00 0.00 0.96 0.04 1.00 0.00 1.00 0.00 0.00 0.00
Final Sat: 1895 1900 0 0 1818 73 1805 0 1615 0 0 0

Capacity Analysis Module:
Vol/Sat: 0.09 0.64 0.00 0.00 0.48 0.48 0.06 0.00 0.07 0.00 0.00 0.00
Crit Moves: 10.3 68.0 0.0 0.0 57.7 57.7 10.0 0.0 10.0 0.0 0.0 0.0
Green Time: 0.75 0.85 0.00 0.00 0.75 0.75 0.50 0.00 0.61 0.00 0.00 0.00
Volume/Cap: 52.8 12.5 0.0 0.0 13.8 13.8 39.6 0.0 44.3 0.0 0.0 0.0
Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
User DelAdj: 52.8 12.5 0.0 0.0 13.8 13.8 39.6 0.0 44.3 0.0 0.0 0.0
AdjDel/Veh: 4 23 0 0 16 16 3 0 3 0 0 0
HCM2kVg: 4 23 0 0 16 16 3 0 3 0 0 0

Level Of Service Computer Report
2000 HCM Operations (Future Volume Alternative)
Cumulative No Project PM

Intersection #16: Union/Atherton



Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 10 10 10 10 10 10

Volume Module:

Base Vol: 0 155 0 430 220 160 225 75 0 0 75 555

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 0 155 0 430 220 160 225 75 0 0 75 555

Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0

PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0

Initial Fut: 0 155 0 430 220 160 225 75 0 0 75 555

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 0 155 0 430 220 160 225 75 0 0 75 555

Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 0 155 0 430 220 160 225 75 0 0 75 555

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Vol: 0 155 0 430 220 160 225 75 0 0 75 555

Saturation Flow Module:

Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900

Adjustment: 1.00 1.00 1.00 0.95 0.94 0.94 0.71 1.00 1.00 1.00 1.00 0.85

Lanes: 1.00 1.00 0.00 1.00 0.58 0.42 1.00 1.00 0.00 0.00 1.00 1.00

Final Sat: 1900 1900 0 1805 1031 750 1345 1900 0 0 1900 1615

Capacity Analysis Module:

Vol/Sat: 0.00 0.08 0.00 0.24 0.21 0.21 0.17 0.04 0.00 0.00 0.04 0.34

Crit Moves: ****

Green Time: 0.0 10.6 0.0 30.8 41.4 41.4 21.6 21.6 0.0 0.0 21.6 52.4

Volume/Cap: 0.00 0.58 0.00 0.58 0.39 0.39 0.58 0.14 0.00 0.00 0.14 0.49

Delay/Veh: 0.0 33.3 0.0 18.2 9.8 9.8 25.0 19.9 0.0 0.0 19.9 5.5

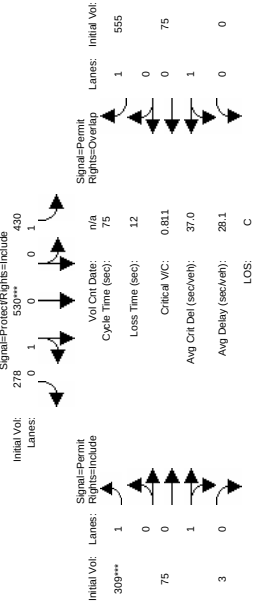
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

AdjDel/Veh: 0.0 33.3 0.0 18.2 9.8 9.8 25.0 19.9 0.0 0.0 19.9 5.5

HC2kAvg: 0 4 0 8 5 5 6 1 0 0 1 6

Level Of Service Computer Report
2000 HCM Operations (Future Volume Alternative)
Cumulative Project PM

Intersection #16: Union/Atherton



Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 10 10 10 10 10 10

Volume Module:

Base Vol: 0 155 0 430 220 160 225 75 0 0 75 555

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 0 155 0 430 220 160 225 75 0 0 75 555

Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0

PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0

Initial Fut: 0 155 0 430 220 160 225 75 0 0 75 555

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 0 155 0 430 220 160 225 75 0 0 75 555

Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 0 155 0 430 220 160 225 75 0 0 75 555

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Vol: 0 155 0 430 220 160 225 75 0 0 75 555

Saturation Flow Module:

Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900

Adjustment: 1.00 1.00 1.00 0.95 0.95 0.95 0.71 0.99 0.99 1.00 1.00 0.85

Lanes: 1.00 1.00 0.00 1.00 0.66 0.34 1.00 0.96 0.04 0.00 1.00 1.00

Final Sat: 1805 1900 0 1805 1181 620 1345 1816 73 0 1900 1615

Capacity Analysis Module:

Vol/Sat: 0.00 0.19 0.00 0.24 0.45 0.45 0.23 0.04 0.04 0.00 0.04 0.34

Crit Moves: ****

Green Time: 7.0 19.5 0.0 24.5 37.0 37.0 19.0 19.0 0.0 0.0 19.0 43.5

Volume/Cap: 0.03 0.73 0.00 0.73 0.91 0.91 0.91 0.16 0.16 0.00 0.16 0.59

Delay/Veh: 31.0 30.8 0.0 26.9 30.4 30.4 54.2 22.0 22.0 0.0 21.9 11.1

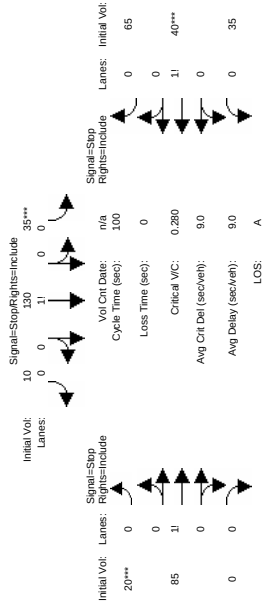
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

AdjDel/Veh: 31.0 30.8 0.0 26.9 30.4 30.4 54.2 22.0 22.0 0.0 21.9 11.1

HC2kAvg: 0 9 0 9 18 18 11 1 1 0 1 9

Level Of Service Computer Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative No Project AM

Intersection #17: Union/Woodward



LOS: A

Lanes: 10 0 0 31 0 0 0
Initial Vol: 10 160*** 40
Signal-Stop Rights-Include

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

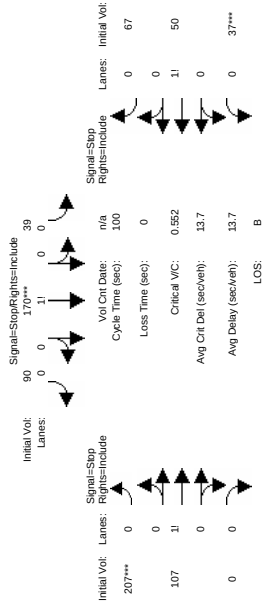
Volume Module:
Base Vol: 10 160 40 35 130 10 20 85 0 35 40 65
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 10 160 40 35 130 10 20 85 0 35 40 65
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 10 160 40 35 130 10 20 85 0 35 40 65
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 10 160 40 35 130 10 20 85 0 35 40 65
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 10 160 40 35 130 10 20 85 0 35 40 65
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 10 160 40 35 130 10 20 85 0 35 40 65

Saturation Flow Module:
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.05 0.76 0.19 0.20 0.74 0.06 0.19 0.81 0.00 0.25 0.29 0.46
Final Sat: 36 571 143 145 537 41 128 542 0 179 204 332

Capacity Analysis Module:
Vol/Sat: 0.28 0.28 0.28 0.24 0.24 0.24 0.16 0.16 xxxx 0.20 0.20 0.20
Crit Moves: 9.3 9.3 9.3 9.2 9.2 9.2 8.8 8.8 0.0 8.7 8.7 8.7
Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 9.3 9.3 9.3 9.2 9.2 9.2 8.8 8.8 0.0 8.7 8.7 8.7
LOS by Move: A A A A A A A A A A A A
ApproachDel: 9.3 9.2 8.8 8.8 0.0 8.7 8.7 8.7
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
ApprAdjDel: 9.3 9.2 8.8 8.8 0.0 8.7 8.7 8.7
LOS by Appr: A A A A A A A A

Level Of Service Computer Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative Project AM

Intersection #17: Union/Woodward



LOS: B

Lanes: 10 0 0 31 0 0 0
Initial Vol: 10 253*** 44
Signal-Stop Rights-Include

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

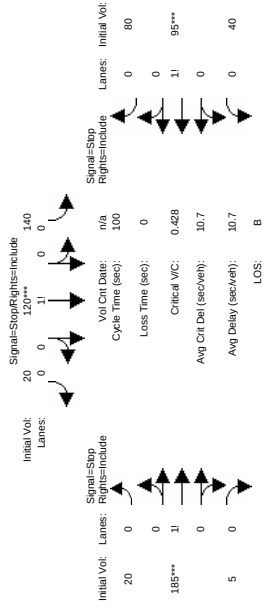
Volume Module:
Base Vol: 10 160 40 35 130 10 20 85 0 35 40 65
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 10 160 40 35 130 10 20 85 0 35 40 65
Added Vol: 0 93 4 4 40 80 187 22 0 2 10 2
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 10 253 44 39 170 90 207 107 0 37 50 67
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 10 253 44 39 170 90 207 107 0 37 50 67
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 10 253 44 39 170 90 207 107 0 37 50 67
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 10 253 44 39 170 90 207 107 0 37 50 67

Saturation Flow Module:
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.03 0.83 0.14 0.13 0.57 0.30 0.66 0.34 0.00 0.24 0.32 0.44
Final Sat: 19 490 85 78 340 180 375 194 0 128 173 232

Capacity Analysis Module:
Vol/Sat: 0.52 0.52 0.52 0.50 0.50 0.50 0.55 0.55 xxxx 0.29 0.29 0.29
Crit Moves: 13.9 13.9 13.9 13.5 13.5 13.5 15.2 15.2 0.0 11.0 11.0 11.0
Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 13.9 13.9 13.9 13.5 13.5 13.5 15.2 15.2 0.0 11.0 11.0 11.0
LOS by Move: B B B B B B C C C B B B
ApproachDel: 13.9 13.5 13.5 13.5 13.5 13.5 15.2 15.2
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
ApprAdjDel: 13.9 13.5 13.5 13.5 13.5 13.5 15.2 15.2
LOS by Appr: B B B B B B C C

Level of Service Computer Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative No Project PM

Intersection #17: Union/Woodward



Lanes: 0 0 31 0 0
Initial Vol: 5 90*** 35

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Volume Module:

Base Vol: 5 90 35 140 120 20 20 185 5 40 95 80
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 5 90 35 140 120 20 20 185 5 40 95 80
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 5 90 35 140 120 20 20 185 5 40 95 80
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 5 90 35 140 120 20 20 185 5 40 95 80
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 5 90 35 140 120 20 20 185 5 40 95 80
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 5 90 35 140 120 20 20 185 5 40 95 80

Saturation Flow Module:

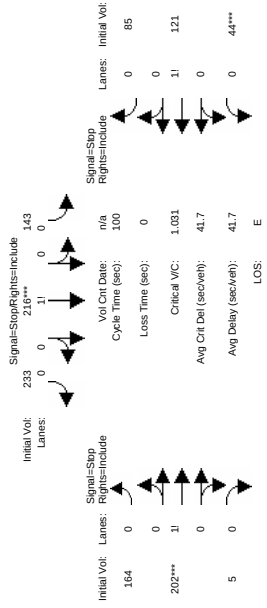
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.04 0.69 0.27 0.50 0.43 0.07 0.10 0.88 0.02 0.19 0.44 0.37
Final Sat: 24 435 169 327 280 47 61 564 15 123 293 246

Capacity Analysis Module:

Vol/Sat: 0.21 0.21 0.21 0.43 0.43 0.43 0.33 0.33 0.33 0.32 0.32 0.32
Crit Moves: 9.4 9.4 9.4 11.7 11.7 11.7 10.6 10.6 10.6 10.3 10.3 10.3
Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 9.4 9.4 9.4 11.7 11.7 11.7 10.6 10.6 10.6 10.3 10.3 10.3
LOS by Move: A A A B B B B B B B B B
ApproachDel: 9.4 11.7 10.6 10.3 10.3 10.3 10.3 10.3 10.3 10.3 10.3 10.3
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
ApprAdjDel: 9.4 11.7 10.6 10.3 10.3 10.3 10.3 10.3 10.3 10.3 10.3 10.3
LOS by Appr: A A B B B B B B B B B B

Level of Service Computer Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative Project PM

Intersection #17: Union/Woodward



Lanes: 0 0 31 0 0
Initial Vol: 5 150*** 37

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Volume Module:

Base Vol: 5 90 35 140 120 20 20 185 5 40 95 80
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 5 90 35 140 120 20 20 185 5 40 95 80
Added Vol: 0 60 2 3 96 213 144 17 0 4 26 5
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 5 150 37 143 216 233 164 202 5 44 121 85
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 5 150 37 143 216 233 164 202 5 44 121 85
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 5 150 37 143 216 233 164 202 5 44 121 85
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol: 5 150 37 143 216 233 164 202 5 44 121 85

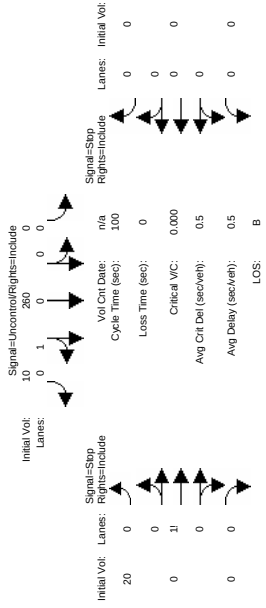
Saturation Flow Module:

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.03 0.78 0.19 0.24 0.36 0.40 0.44 0.55 0.01 0.18 0.48 0.34
Final Sat: 12 362 89 139 210 226 223 274 7 85 235 165

Capacity Analysis Module:

Vol/Sat: 0.41 0.41 0.41 1.03 1.03 1.03 0.74 0.74 0.74 0.52 0.52 0.52
Crit Moves: 14.7 14.7 14.7 70.5 70.5 70.5 26.3 26.3 26.3 16.9 16.9 16.9
Delay/Veh: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 14.7 14.7 14.7 70.5 70.5 70.5 26.3 26.3 26.3 16.9 16.9 16.9
LOS by Move: B B B F F F D D D C C C
ApproachDel: 14.7 70.5 26.3 26.3 26.3 26.3 26.3 26.3 26.3 16.9 16.9 16.9
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
ApprAdjDel: 14.7 70.5 26.3 26.3 26.3 26.3 26.3 26.3 26.3 16.9 16.9 16.9
LOS by Appr: B B F F F F D D D C C C

Intersection #18: Union/Peach



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

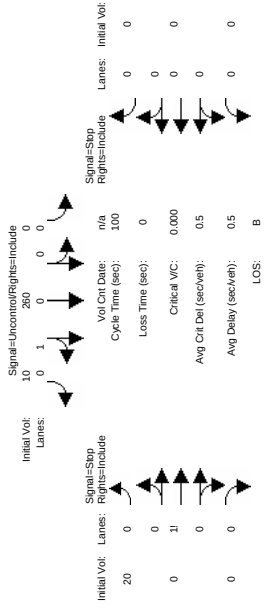
Volume Module:
Base Vol: 5 265 0 0 260 10 20 0 0 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 5 265 0 0 260 10 20 0 0 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 5 265 0 0 260 10 20 0 0 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 5 265 0 0 260 10 20 0 0 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 5 265 0 0 260 10 20 0 0 0 0 0

Critical Gap Module:
Critical Gap: 4.1 xxxx xxxx xxxx xxxx 6.4 xxxx xxxx xxxx xxxx
FollowupTm: 2.2 xxxx xxxx xxxx xxxx 3.5 xxxx xxxx xxxx xxxx

Capacity Module:
Conflict Vol: 270 xxxx xxxx xxxx 540 xxxx xxxx xxxx
Potential Cap.: 1305 xxxx xxxx xxxx 506 xxxx xxxx xxxx
Move Cap.: 1305 xxxx xxxx xxxx 505 xxxx xxxx xxxx
Volume/Cap: 0.00 xxxx xxxx xxxx 0.04 xxxx xxxx xxxx

Level of Service Module:
Queue: 0.0 xxxx xxxx xxxx 0.1 xxxx xxxx xxxx
Stopped Del: 7.8 xxxx xxxx xxxx 12.4 xxxx xxxx xxxx
LOS by Move: A * B
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx
Shared Queue: 0.0 xxxx xxxx xxxx xxxx
Shrd StpDel: 7.8 xxxx xxxx xxxx xxxx
Shared LOS: A * * * * *
ApproachDel: xxxxxx * 12.4 B
ApproachLOS: xxxxxx * xxxxxx *

Intersection #18: Union/Peach



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:
Base Vol: 5 265 0 0 260 10 20 0 0 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 5 265 0 0 260 10 20 0 0 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 5 265 0 0 260 10 20 0 0 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 5 265 0 0 260 10 20 0 0 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Vol: 5 265 0 0 260 10 20 0 0 0 0 0

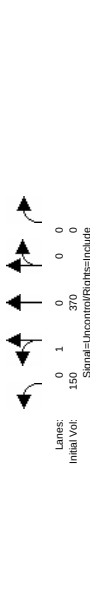
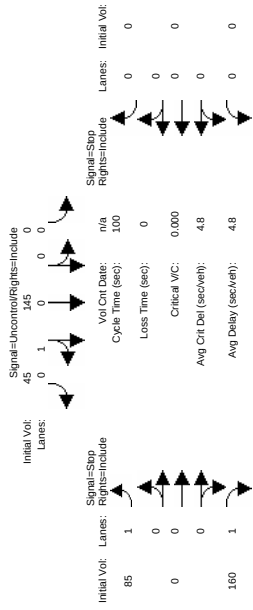
Critical Gap Module:
Critical Gap: 4.1 xxxx xxxx xxxx xxxx 6.4 xxxx xxxx xxxx xxxx
FollowupTm: 2.2 xxxx xxxx xxxx xxxx 3.5 xxxx xxxx xxxx xxxx

Capacity Module:
Conflict Vol: 270 xxxx xxxx xxxx 540 xxxx xxxx xxxx
Potential Cap.: 1305 xxxx xxxx xxxx 506 xxxx xxxx xxxx
Move Cap.: 1305 xxxx xxxx xxxx 505 xxxx xxxx xxxx
Volume/Cap: 0.00 xxxx xxxx xxxx 0.04 xxxx xxxx xxxx

Level of Service Module:
Queue: 0.0 xxxx xxxx xxxx 0.1 xxxx xxxx xxxx
Stopped Del: 7.8 xxxx xxxx xxxx 12.4 xxxx xxxx xxxx
LOS by Move: A * B
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx
Shared Queue: 0.0 xxxx xxxx xxxx xxxx
Shrd StpDel: 7.8 xxxx xxxx xxxx xxxx
Shared LOS: A * * * * *
ApproachDel: xxxxxx * 12.4 B
ApproachLOS: xxxxxx * xxxxxx *

Level Of Service Computer Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative No Project AM

Intersection #19: Woodward/Moffat



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module: Lifestyle

Base Vol:	150	370	0	0	145	45	85	0	160	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	150	370	0	0	145	45	85	0	160	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	150	370	0	0	145	45	85	0	160	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	150	370	0	0	145	45	85	0	160	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol:	150	370	0	0	145	45	85	0	160	0	0	0

Critical Gap Module:

Critical Gap:	4.1	xxxx	xxxx	xxxx	xxxx	6.4	xxxx	6.2	xxxx	xxxx	xxxx	xxxx
FollowupTm:	2.2	xxxx	xxxx	xxxx	xxxx	3.5	xxxx	3.3	xxxx	xxxx	xxxx	xxxx

Capacity Module:

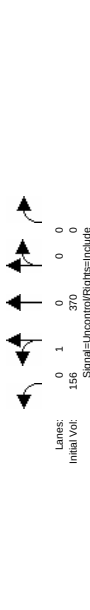
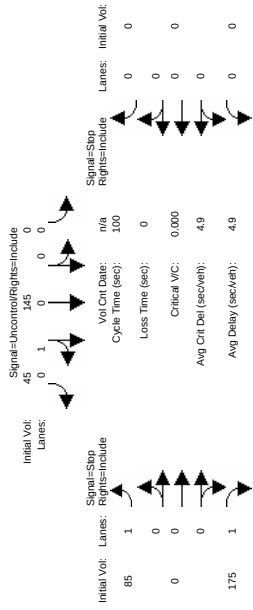
Conflict Vol:	190	xxxx	xxxx	xxxx	xxxx	838	xxxx	168	xxxx	xxxx	xxxx	xxxx
Potent Cap:	1396	xxxx	xxxx	xxxx	xxxx	339	xxxx	882	xxxx	xxxx	xxxx	xxxx
Move Cap:	1396	xxxx	xxxx	xxxx	xxxx	309	xxxx	882	xxxx	xxxx	xxxx	xxxx
Volume/Cap:	0.11	xxxx	xxxx	xxxx	xxxx	0.28	xxxx	0.18	xxxx	xxxx	xxxx	xxxx

Level Of Service Module:

Queue:	0.4	xxxx	xxxx	xxxx	xxxx	1.1	xxxx	0.7	xxxx	xxxx	xxxx	xxxx
Stopped Del:	7.9	xxxx	xxxx	xxxx	xxxx	21.0	xxxx	10.0	xxxx	xxxx	xxxx	xxxx
LOS by Move:	A	*	*	*	*	C	*	A	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap:	0.4	xxxx	xxxx	xxxx	xxxx	309	xxxx	882	xxxx	xxxx	xxxx	xxxx
Shrd StpDel:	7.9	xxxx	xxxx	xxxx	xxxx	0.28	xxxx	0.18	xxxx	xxxx	xxxx	xxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx	*	*	*	*	13.8	B	xxxxxx	*	*	*	*
ApproachLOS:	xxxxxx	*	*	*	*	13.8	B	xxxxxx	*	*	*	*

Level Of Service Computer Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative Project AM

Intersection #19: Woodward/Moffat



Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module: Lifestyle

Base Vol:	150	370	0	0	145	45	85	0	160	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	150	370	0	0	145	45	85	0	160	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	150	370	0	0	145	45	85	0	160	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	150	370	0	0	145	45	85	0	160	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol:	150	370	0	0	145	45	85	0	160	0	0	0

Critical Gap Module:

Critical Gap:	4.1	xxxx	xxxx	xxxx	xxxx	6.4	xxxx	6.2	xxxx	xxxx	xxxx	xxxx
FollowupTm:	2.2	xxxx	xxxx	xxxx	xxxx	3.5	xxxx	3.3	xxxx	xxxx	xxxx	xxxx

Capacity Module:

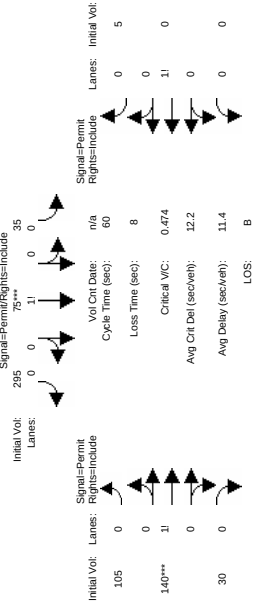
Conflict Vol:	190	xxxx	xxxx	xxxx	xxxx	849	xxxx	168	xxxx	xxxx	xxxx	xxxx
Potent Cap:	1396	xxxx	xxxx	xxxx	xxxx	334	xxxx	882	xxxx	xxxx	xxxx	xxxx
Move Cap:	1396	xxxx	xxxx	xxxx	xxxx	302	xxxx	882	xxxx	xxxx	xxxx	xxxx
Volume/Cap:	0.11	xxxx	xxxx	xxxx	xxxx	0.28	xxxx	0.20	xxxx	xxxx	xxxx	xxxx

Level Of Service Module:

Queue:	0.4	xxxx	xxxx	xxxx	xxxx	1.1	xxxx	0.7	xxxx	xxxx	xxxx	xxxx
Stopped Del:	7.9	xxxx	xxxx	xxxx	xxxx	21.5	xxxx	10.1	xxxx	xxxx	xxxx	xxxx
LOS by Move:	A	*	*	*	*	C	*	B	*	*	*	*
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT
Shared Cap:	0.4	xxxx	xxxx	xxxx	xxxx	302	xxxx	882	xxxx	xxxx	xxxx	xxxx
Shrd StpDel:	7.9	xxxx	xxxx	xxxx	xxxx	0.28	xxxx	0.20	xxxx	xxxx	xxxx	xxxx
Shared LOS:	A	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx	*	*	*	*	13.8	B	xxxxxx	*	*	*	*
ApproachLOS:	xxxxxx	*	*	*	*	13.8	B	xxxxxx	*	*	*	*

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative No Project AM

Intersection #21: Austin/Moffat/SR-99 SB On



Lanes: 0 1 0 0 1
Initial Vol: 60 70 20
Signal=Permit/Rights=Include

[illegible]

Volume Module: Lifestyle

Base Vol:	60	70	20	35	75	295	105	140	30	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	60	70	20	35	75	295	105	140	30	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	60	70	20	35	75	295	105	140	30	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	60	70	20	35	75	295	105	140	30	0	0
Reduced Vol:	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	60	70	20	35	75	295	105	140	30	0	0
MCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PLPE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	60	70	20	35	75	295	105	140	30	0	0

Saturation Flow Module:

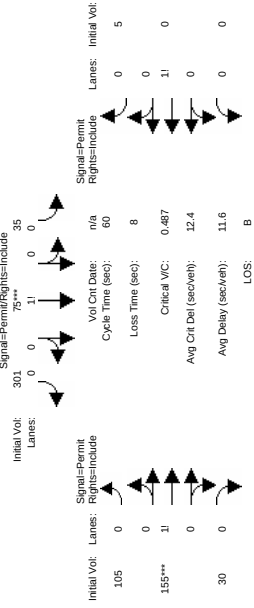
[illegible]

Capacity Analysis Module:

	0.09	0.09	0.01	0.24	0.24	0.17	0.17	0.00	0.00	0.00
Crit Moves:				****						
Green Time:	30.9	30.9	30.9	30.9	30.9	21.1	21.1	0.0	0.0	21.1
Volume/Cap:	0.18	0.18	0.02	0.47	0.47	0.47	0.47	0.00	0.00	0.01
Uniform Del:	7.8	7.2	9.4	9.4	9.4	15.1	15.1	0.0	0.0	12.6
IncrmentDel:	0.1	0.1	0.0	0.4	0.4	0.4	0.6	0.6	0.0	0.0
InitQueueDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00
User Del Adj:	7.9	7.9	7.2	9.8	9.8	9.8	15.7	15.7	0.0	12.6
Delay Del/Veh:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay Del/Veh:	7.9	7.9	7.2	9.8	9.8	9.8	15.7	15.7	0.0	12.6
CM2KAVq:	2	2	0	5	5	5	5	0	0	0

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative Project AM

Intersection #21: Austin/Moffat/SR-99 SB On



Lanes: 0 1 0 0 0

Initial Vol: 60 70

Signal=Perm/Right=Include

[illegible]

Volume Module: Lifestyle

Base Vol:	60	70	20	35	75	295	105	140	30	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	60	70	20	35	75	295	105	140	30	0	0
Added Vol:	0	0	0	0	0	0	15	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	60	70	20	35	75	301	105	155	30	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	60	70	20	35	75	301	105	155	30	0	0
Reduced Vol:	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	60	70	20	35	75	301	105	155	30	0	0
MCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PLPE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol:	60	70	20	35	75	301	105	155	30	0	0

Saturation Flow Module:

[illegible]

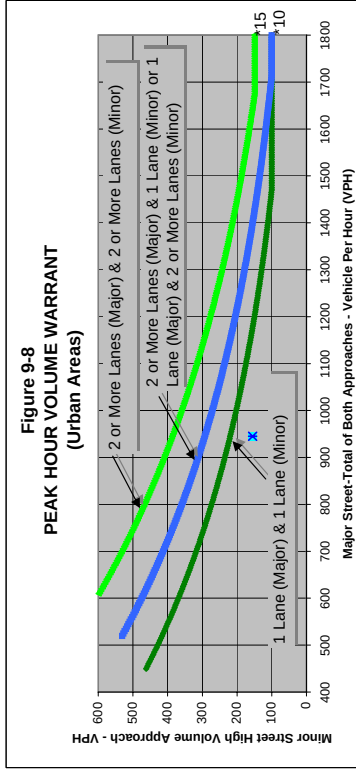
Capacity Analysis Module:

	0.09	0.09	0.01	0.25	0.25	0.25	0.17	0.17	0.00	0.00	0.00
Crit Moves:				***	***						
Green Time:	30.5	30.5	30.5	30.5	30.5	30.5	21.5	21.5	21.5	0.0	21.5
Volume/Cap:	0.18	0.18	0.02	0.46	0.49	0.49	0.49	0.49	0.00	0.00	0.01
Uniform Del:	8.0	8.0	7.3	9.6	9.6	9.6	15.0	15.0	15.0	0.0	12.4
IncrmentDel:	0.1	0.1	0.0	0.4	0.4	0.4	0.6	0.6	0.6	0.0	0.0
InitQueueDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
User Del/Veh:	8.1	8.1	7.4	10.1	10.1	10.1	15.6	15.6	15.6	0.0	12.4
Delay Del/Veh:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ADJ Del/Veh:	8.1	8.1	7.4	10.1	10.1	10.1	15.6	15.6	15.6	0.0	12.4
CM2KAVq:	2	2	0	6	6	6	5	5	5	0	0

CUMULATIVE PROJECT MITIGATION

**APPENDIX C:
SIGNAL WARRANTS**

EXISTING CONDITIONS



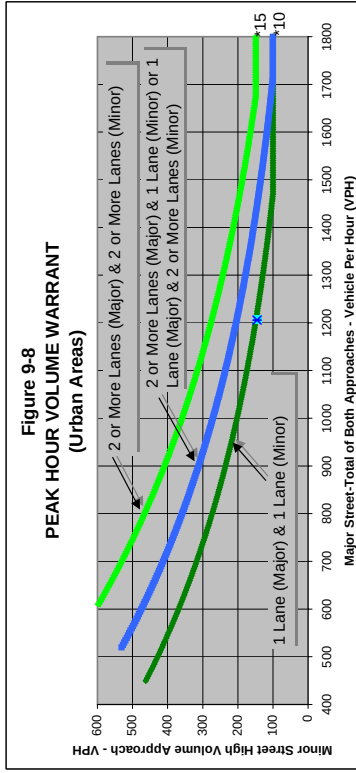
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		945	155	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



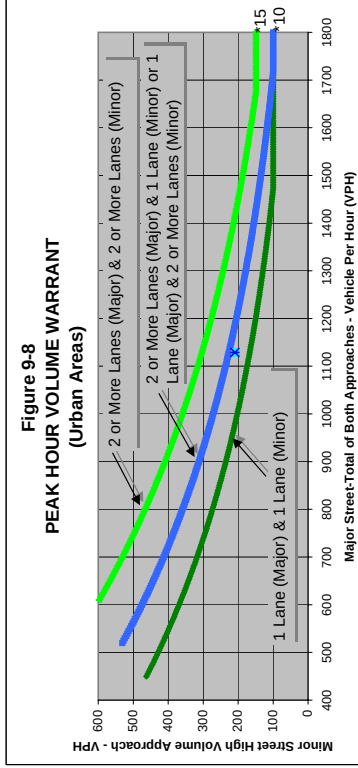
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1206	145	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



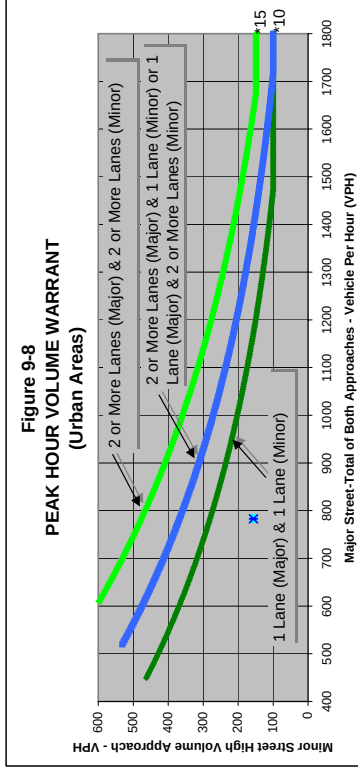
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1129	209	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



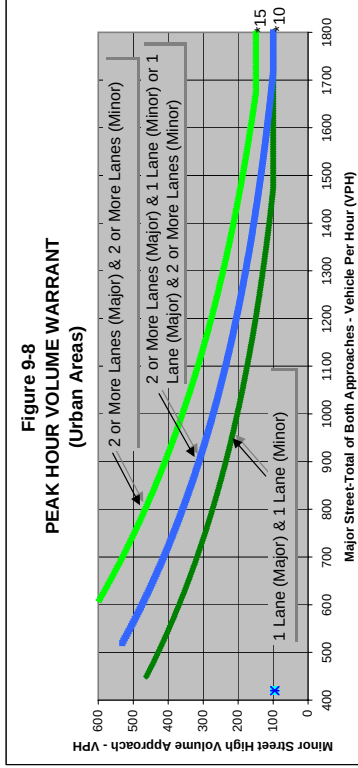
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		783	156	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



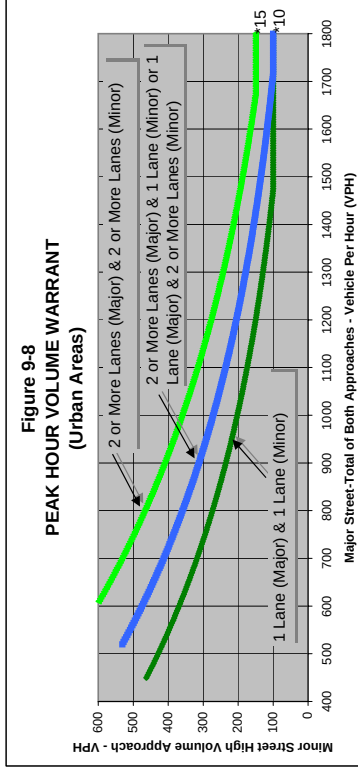
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		420	95	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



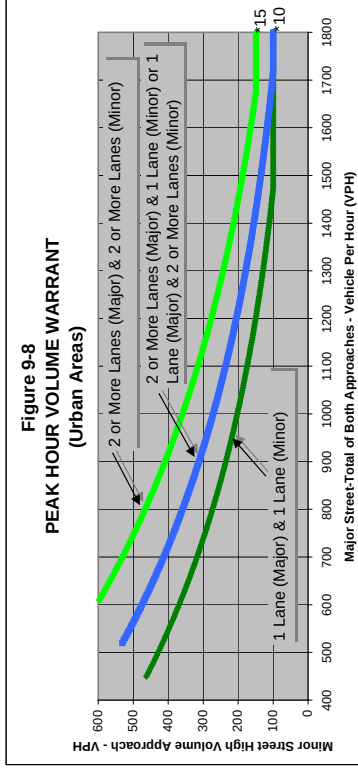
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		332	104	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



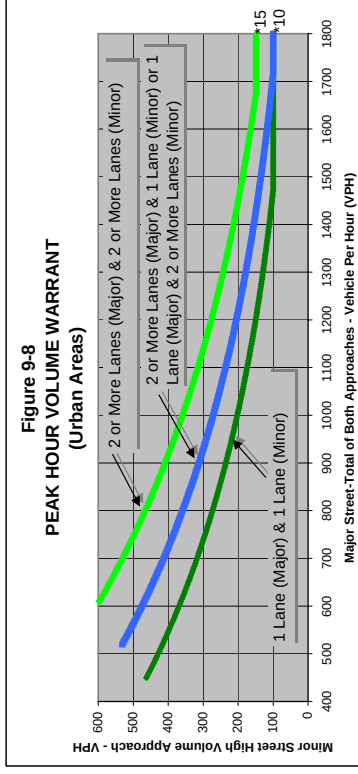
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		150	4	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



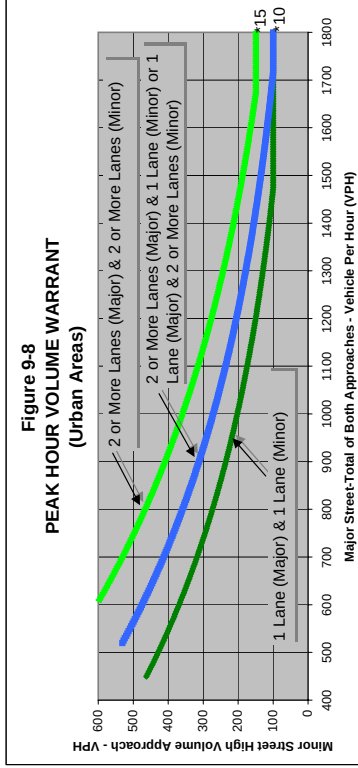
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		185	21	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



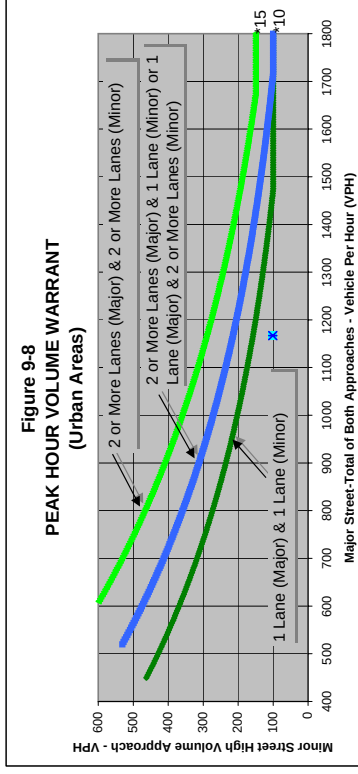
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		10	4	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



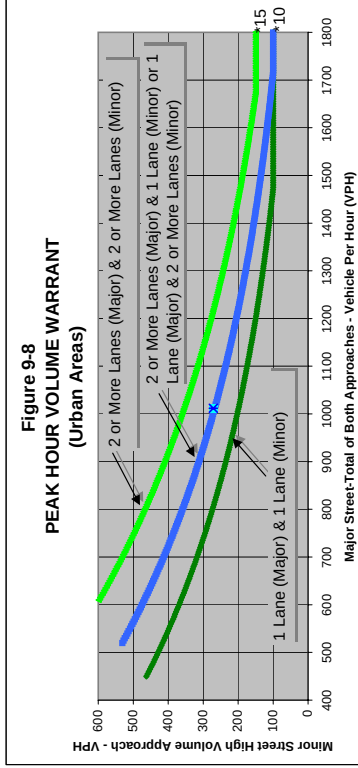
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1167	101	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



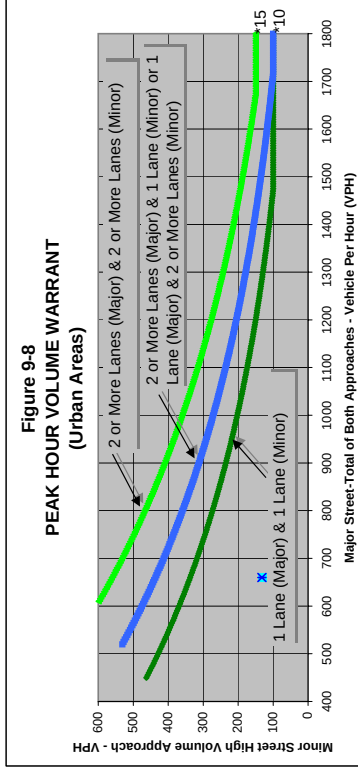
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1012	271	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



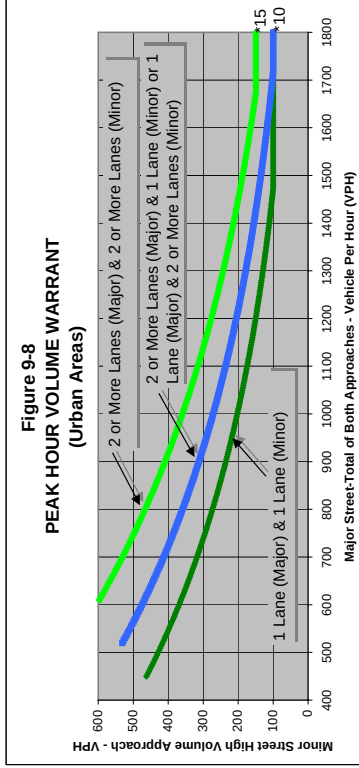
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		660	132	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



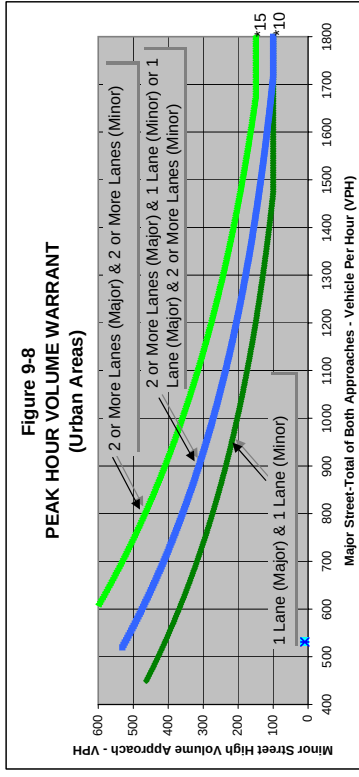
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		366	120	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



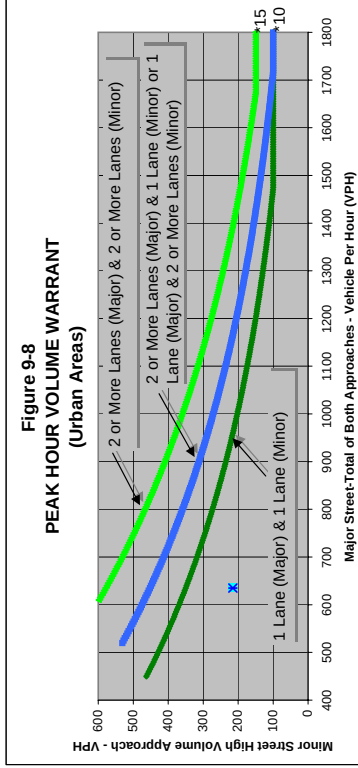
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		531	9	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



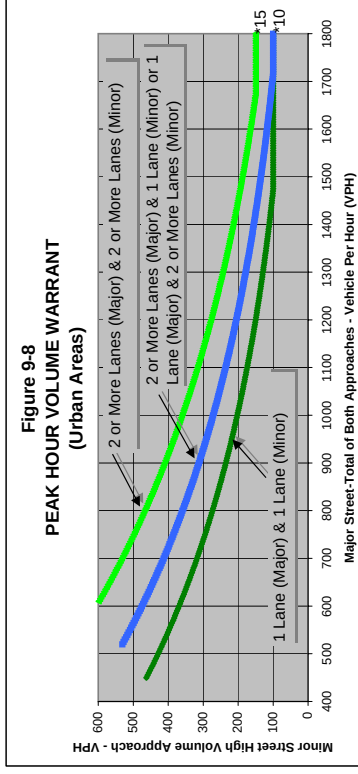
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		635	215	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



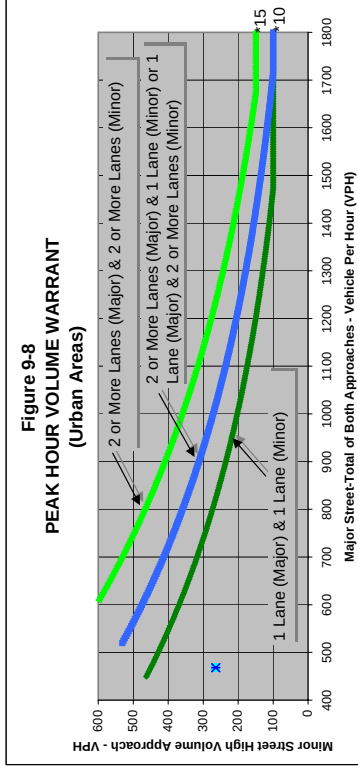
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		533	51	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



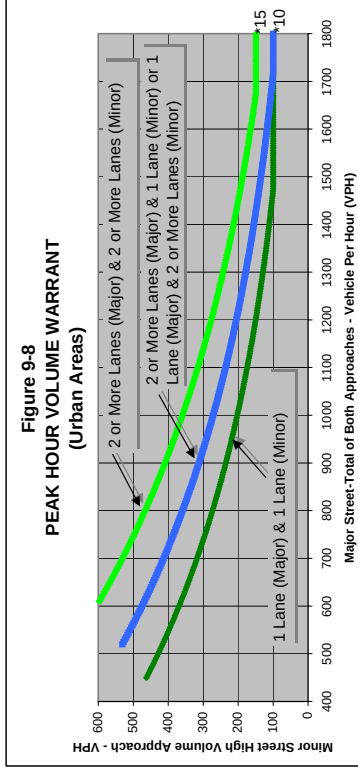
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		468	264	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



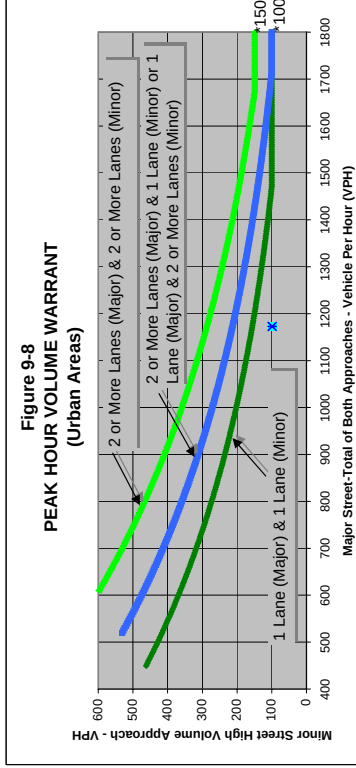
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		327	311	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



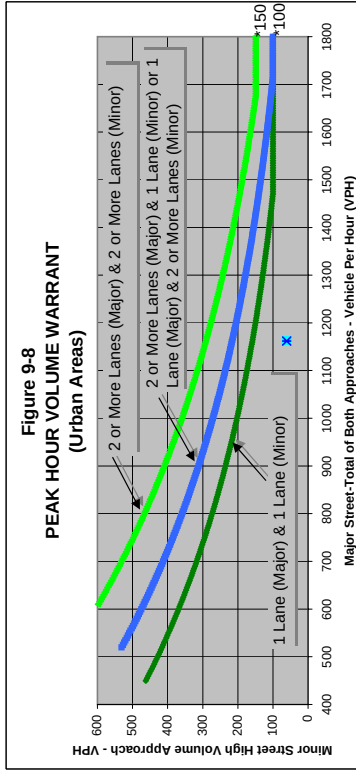
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1173	99	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



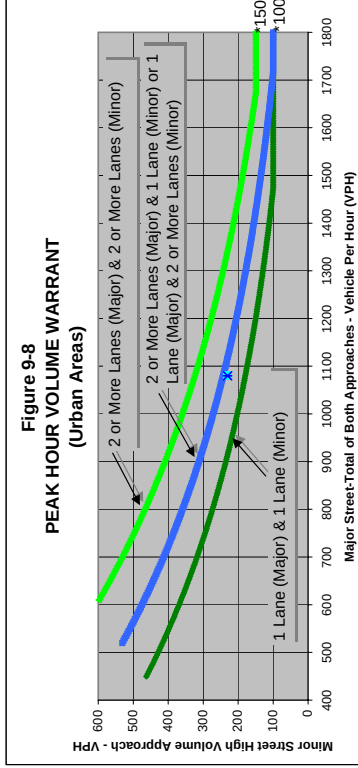
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1162	61	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



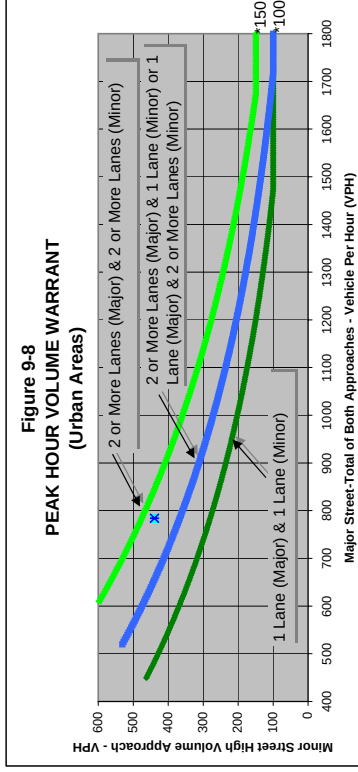
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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1080	230	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



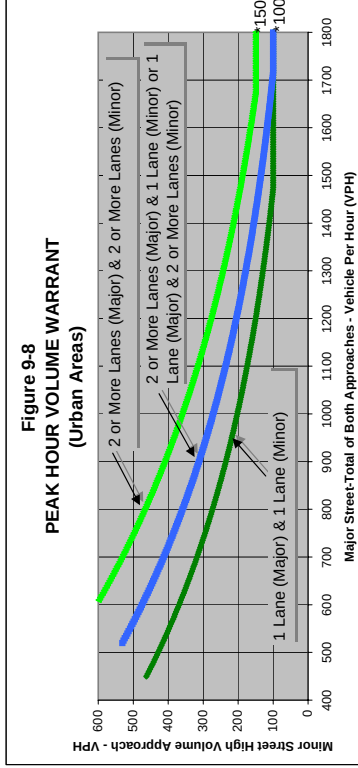
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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		784	439	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



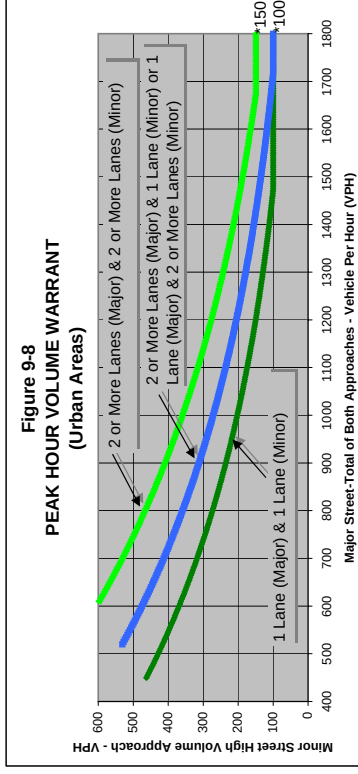
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		589	100	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



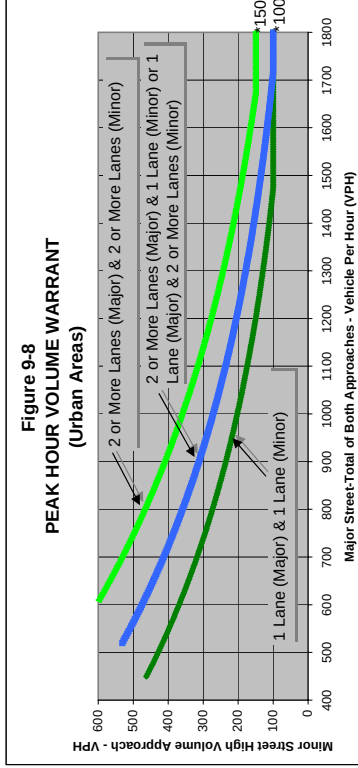
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		392	115	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



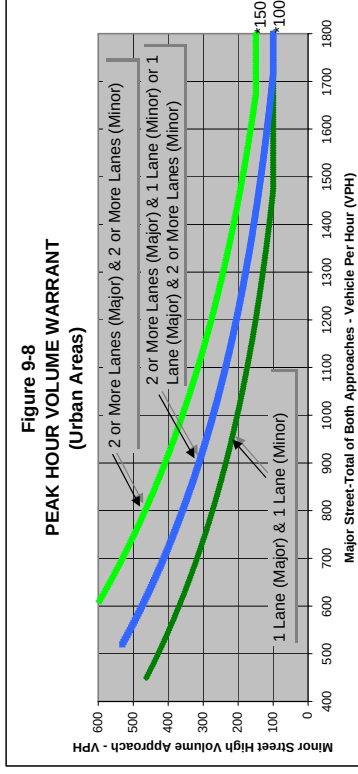
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		275	13	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



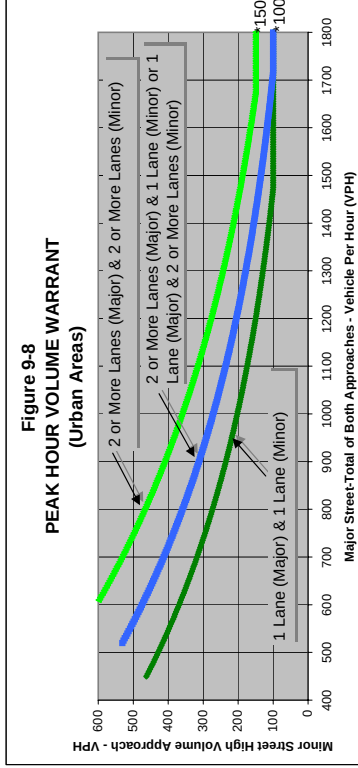
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		258	13	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



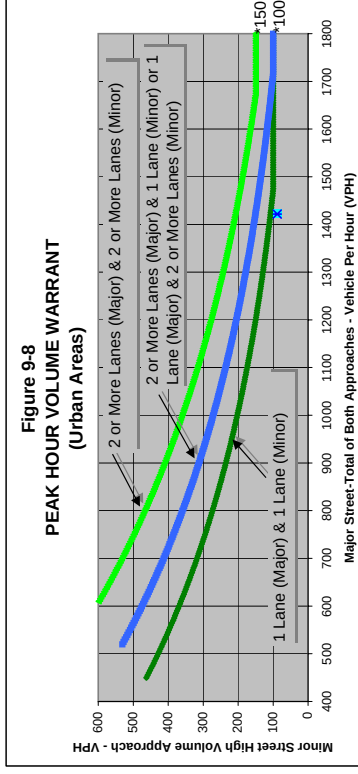
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		24	3	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



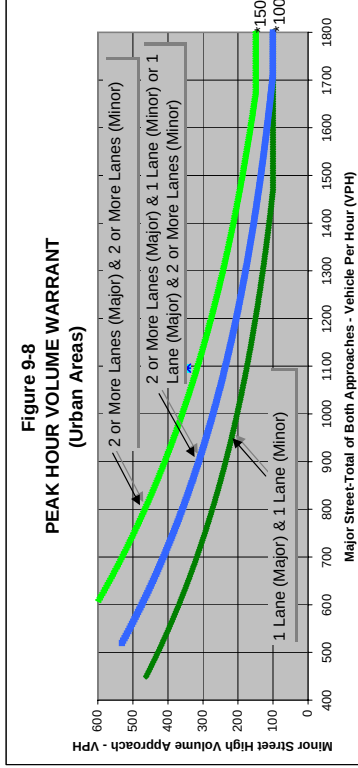
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1422	88	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



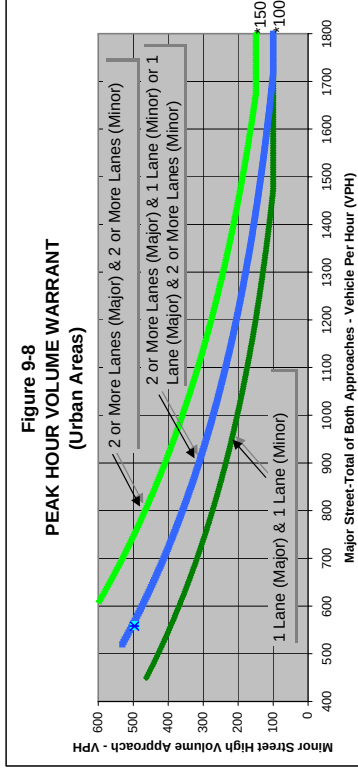
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1096	347	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



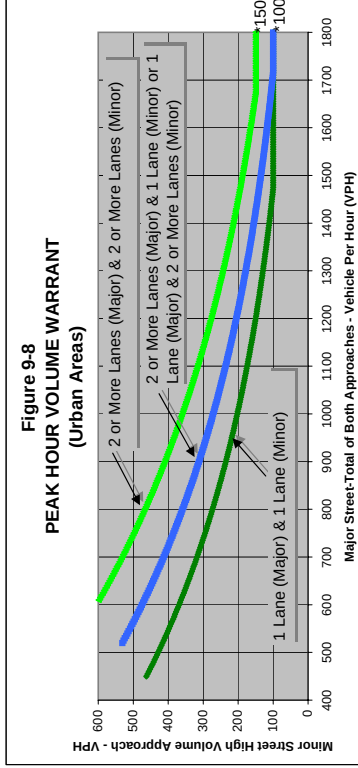
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Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		558	496	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



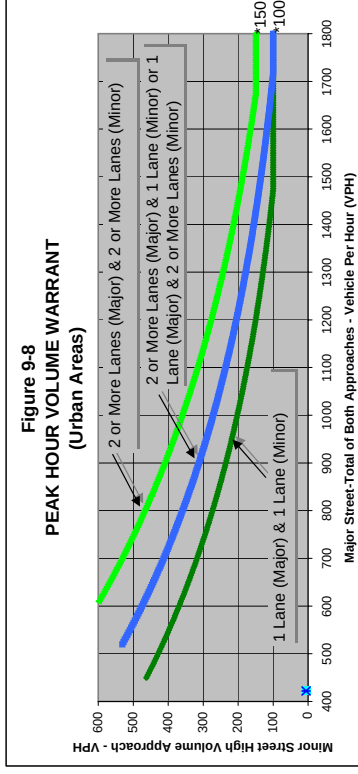
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		356	121	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



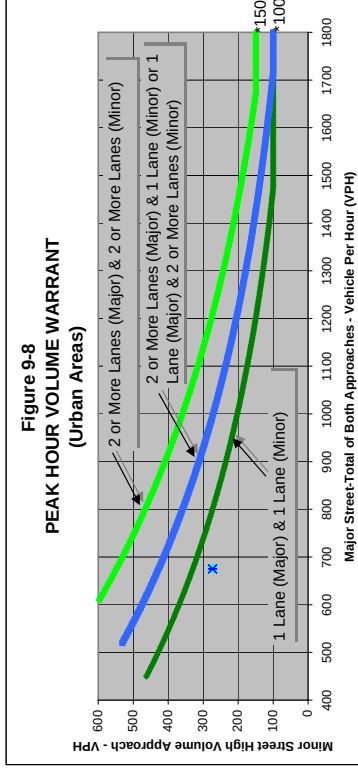
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		422	6	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



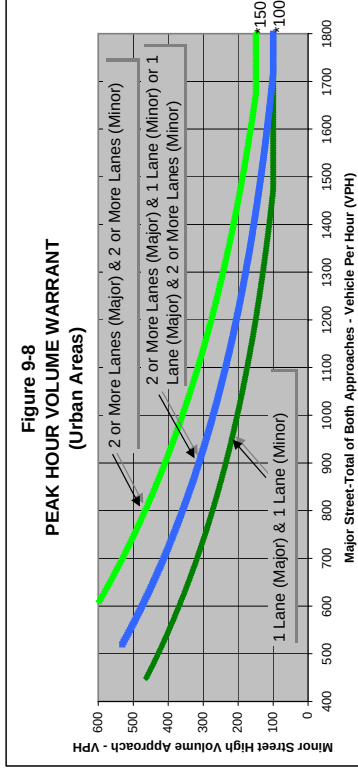
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		675	273	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



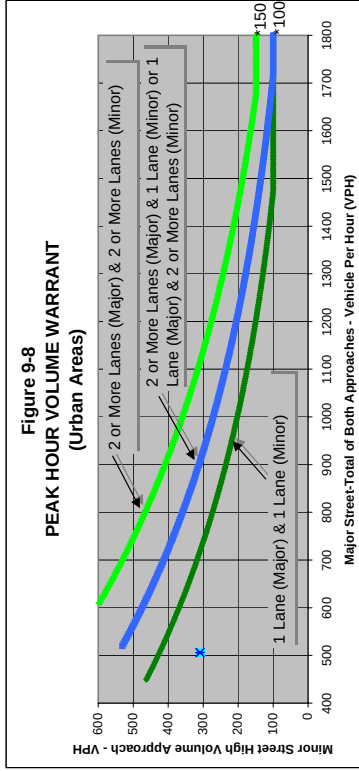
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		647	62	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



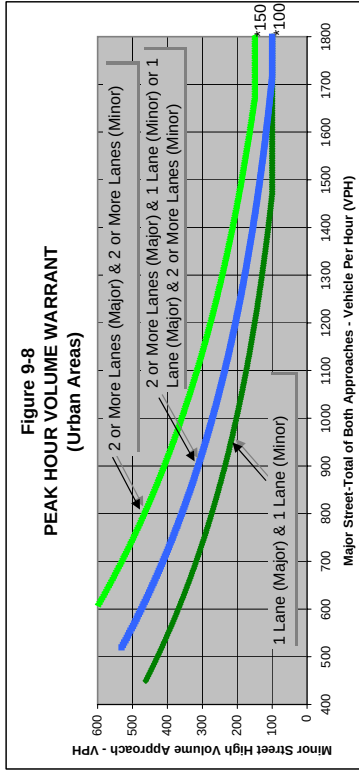
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		506	309	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

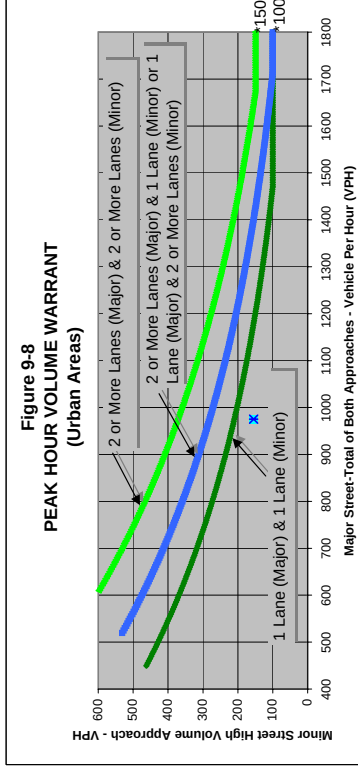
Source: Traffic Manual, Caltrans 1996.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		333	198	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

PROJECT CONDITIONS



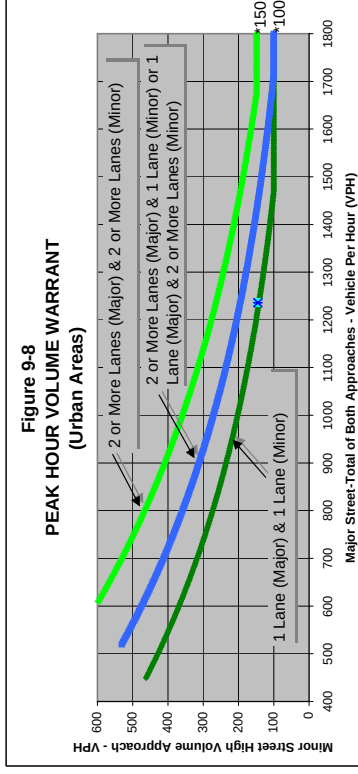
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		975	155	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



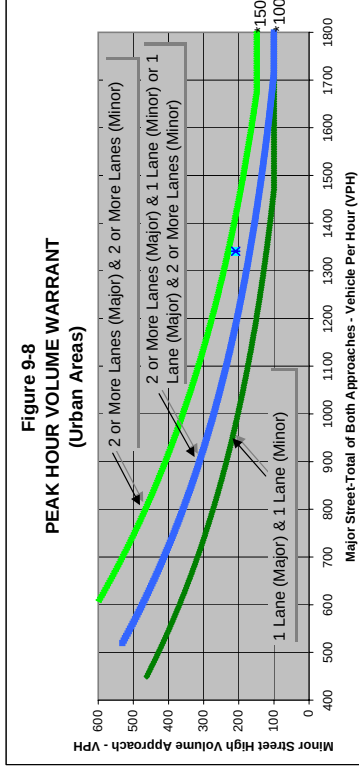
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1236	145	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



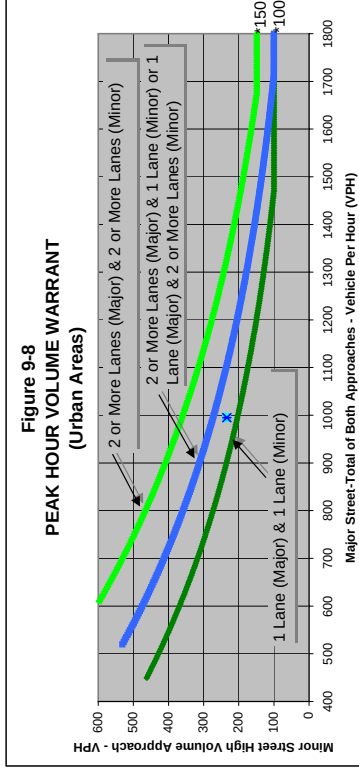
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1341	209	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



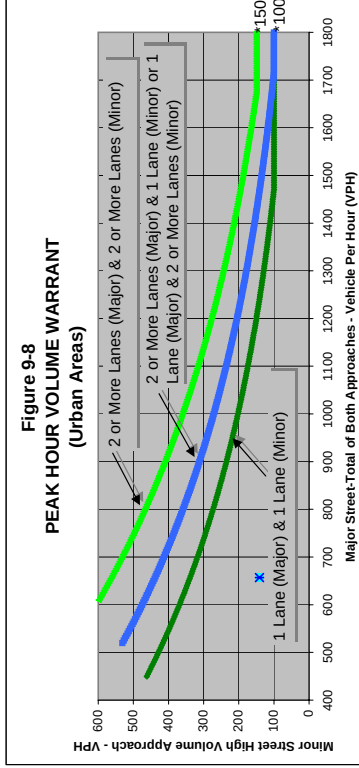
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		995	234	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



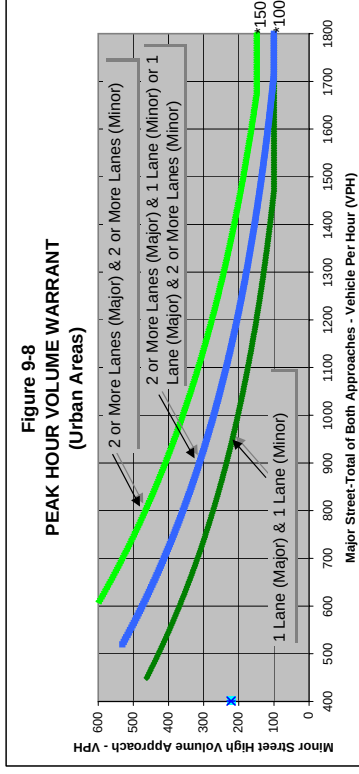
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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		657	141	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



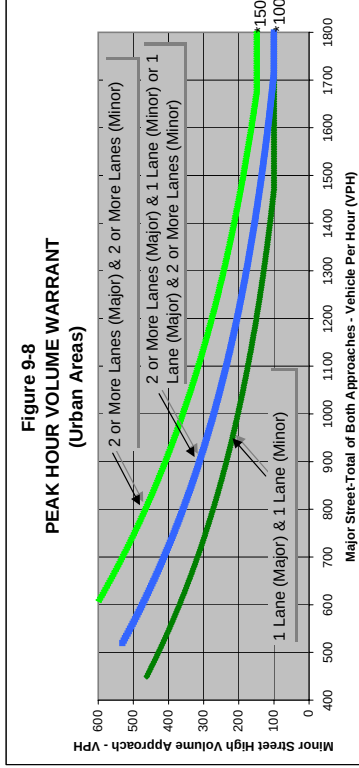
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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		401	222	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



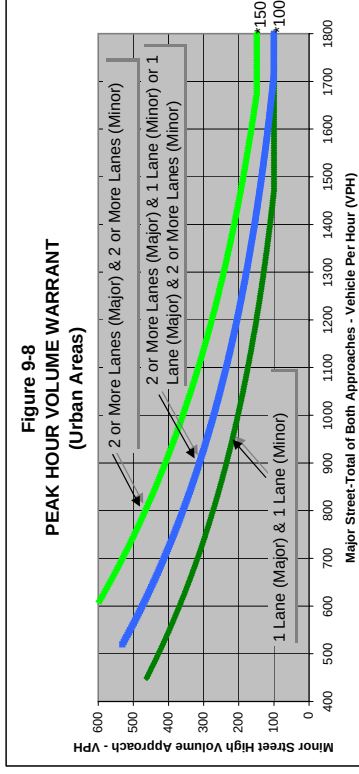
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		152	8	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



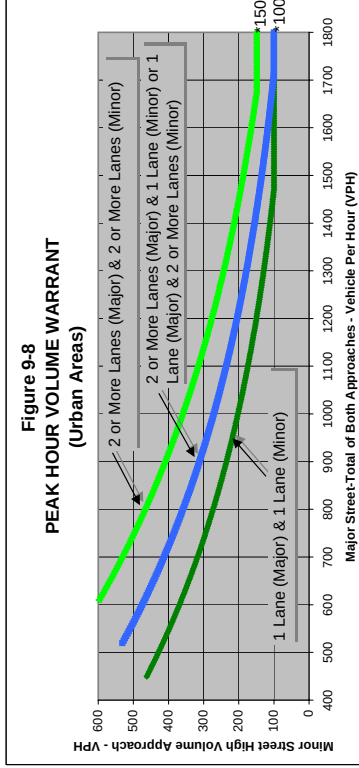
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		378	177	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



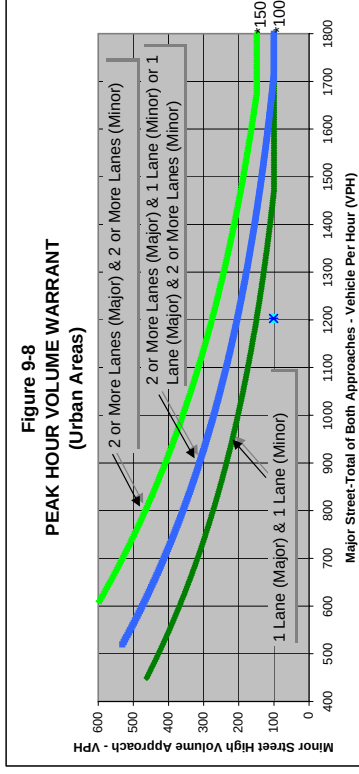
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		14	6	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



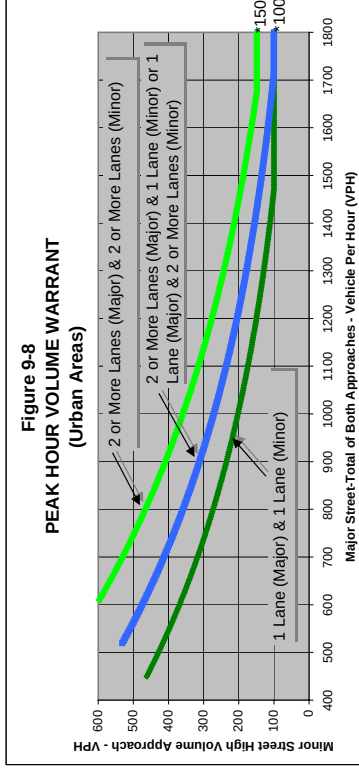
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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1203	101	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



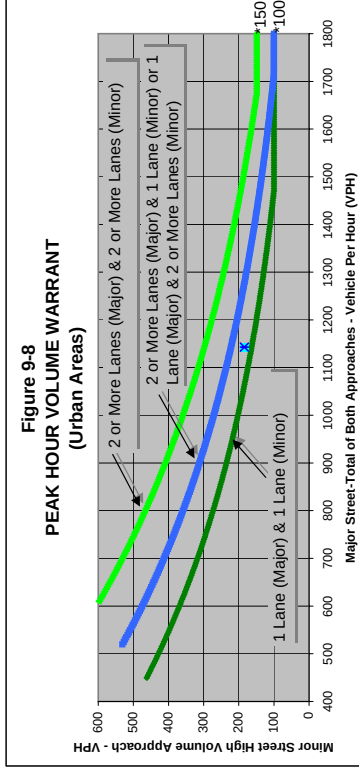
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1170	368	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



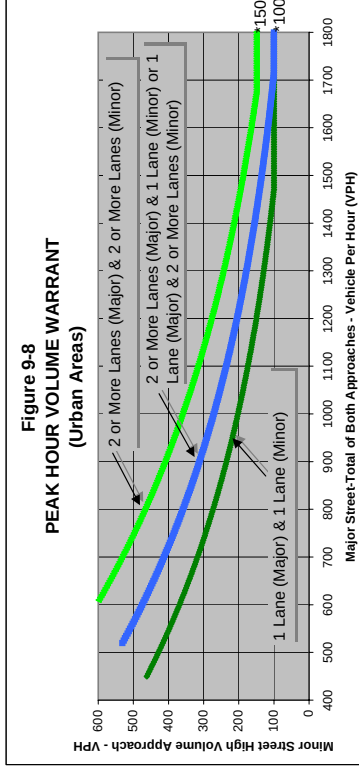
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1143	184	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



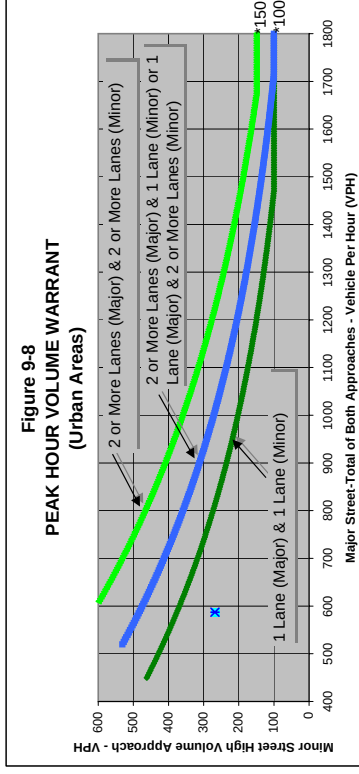
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		833	98	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



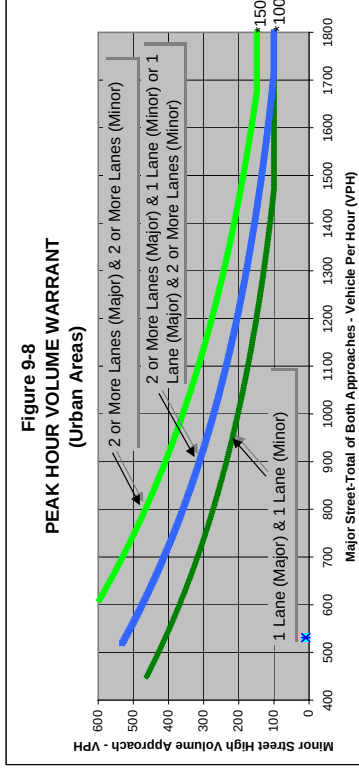
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		587	268	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



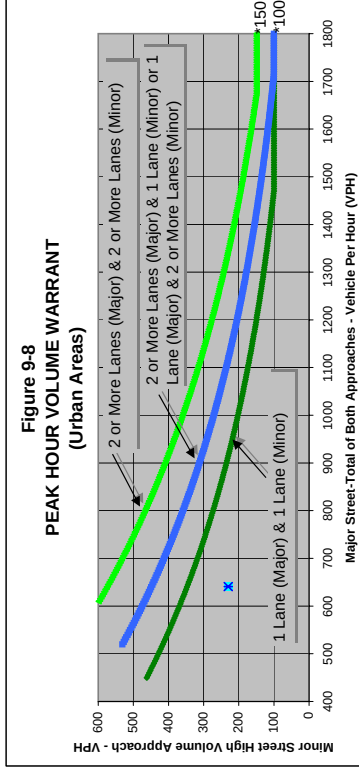
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		531	9	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



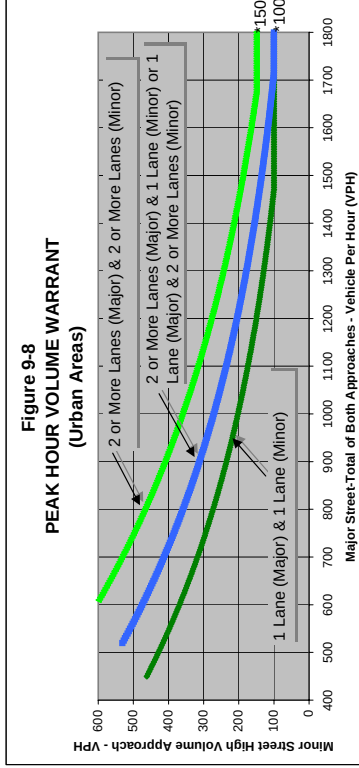
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		641	230	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



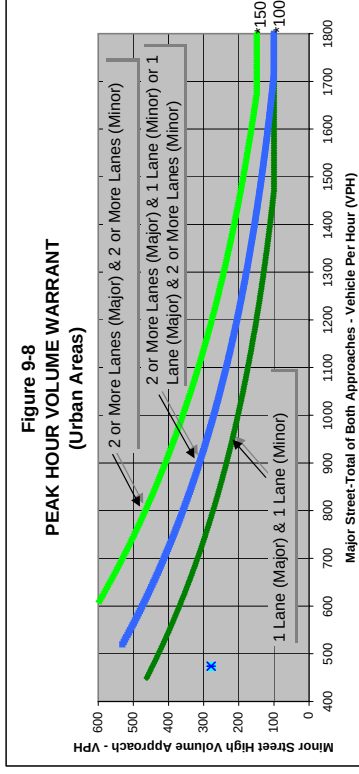
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		553	51	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



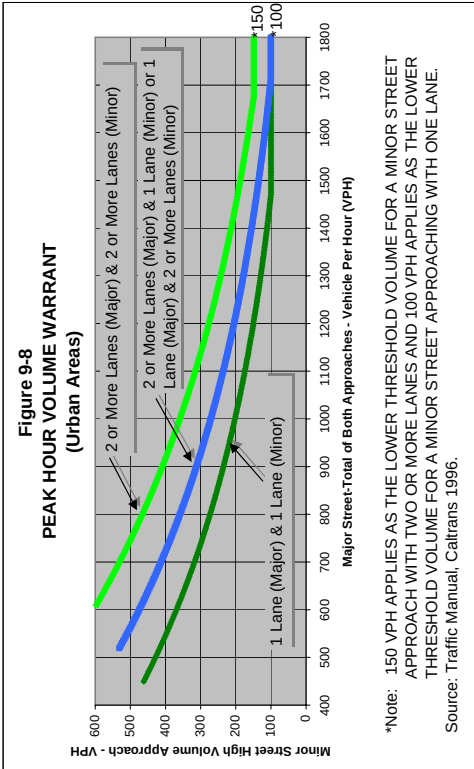
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

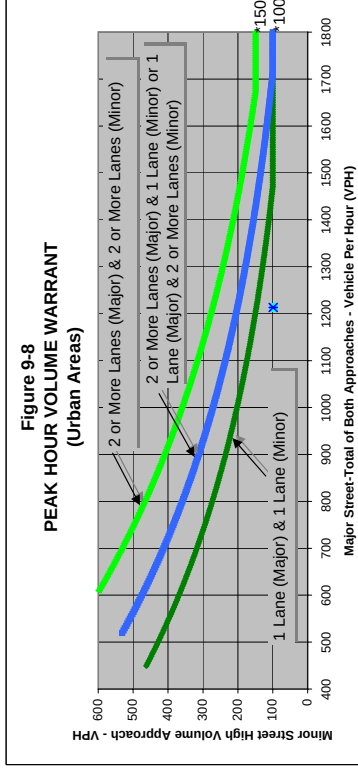
Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		474	279	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		327	317	
*Note: Traffic Volume for Major Street is Total Volume of Both Approaches. Traffic Volume for Minor Street is the Volume of High Volume Approach.				

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



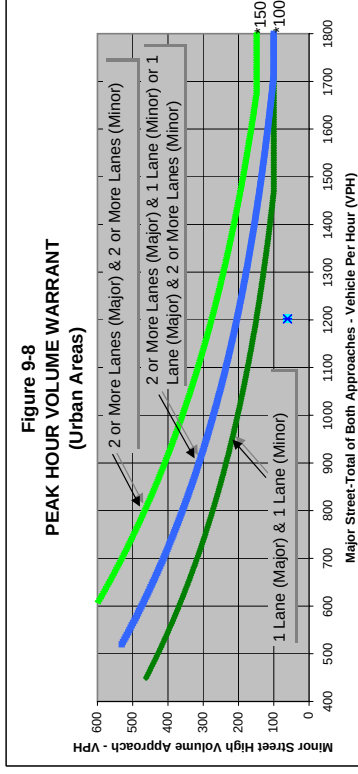
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1213	99	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



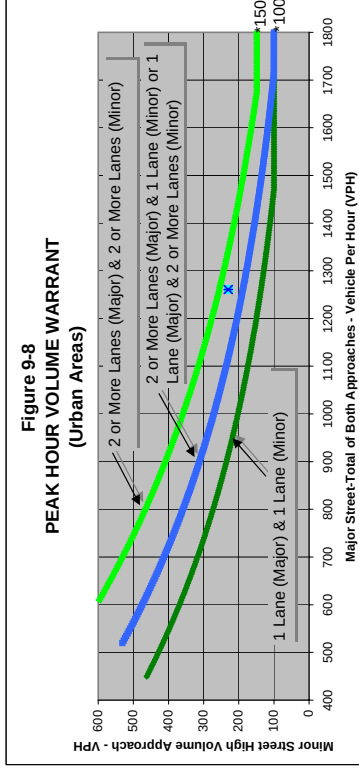
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1202	61	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



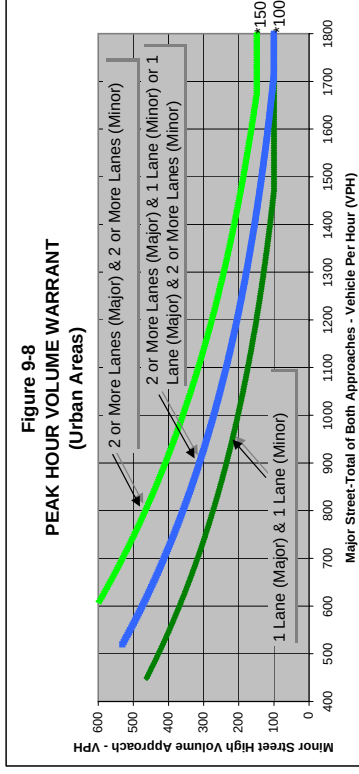
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1261	230	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



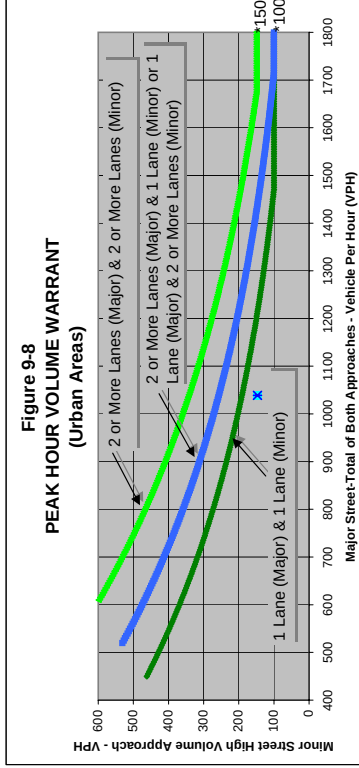
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		965	647	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



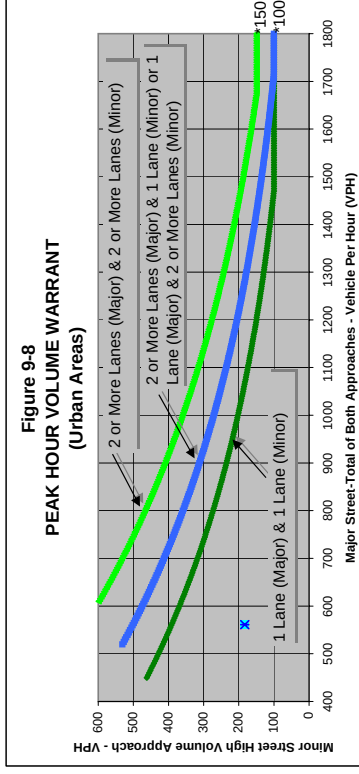
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1039	147	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



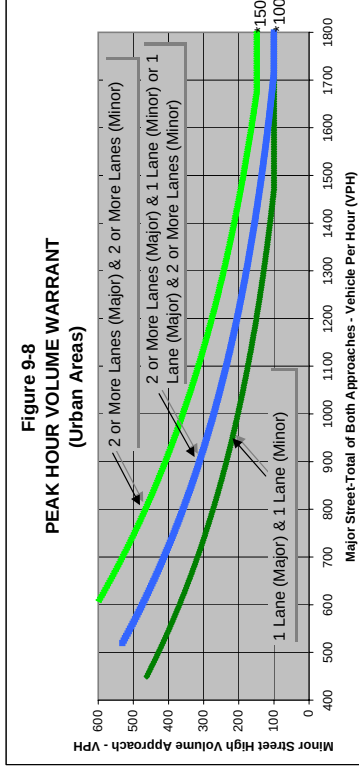
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		561	183	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



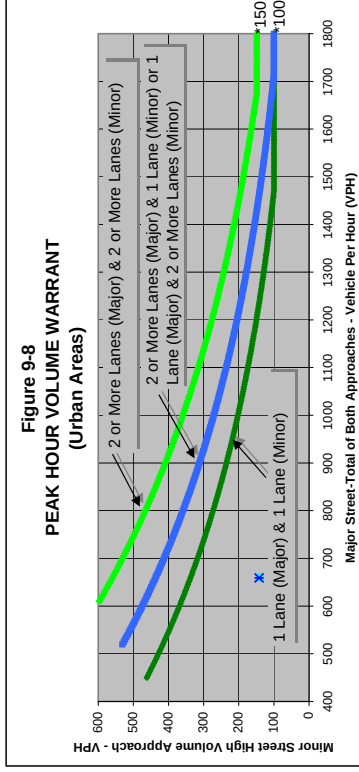
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		279	16	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



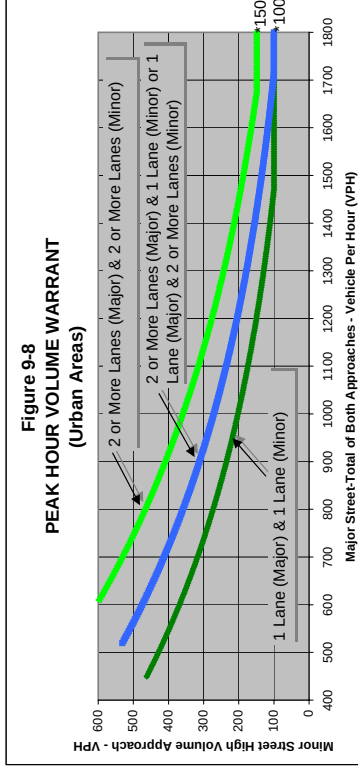
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		659	142	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



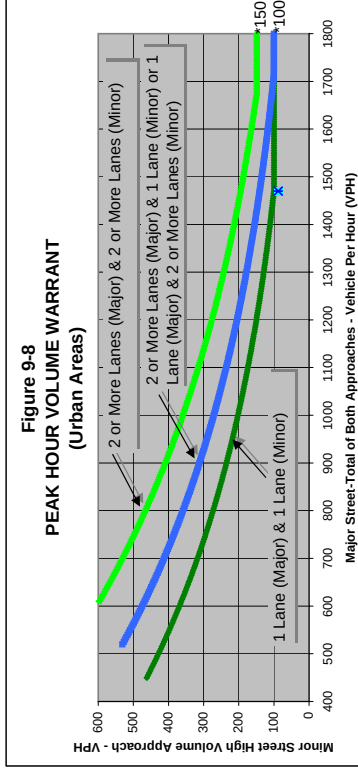
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		28	6	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



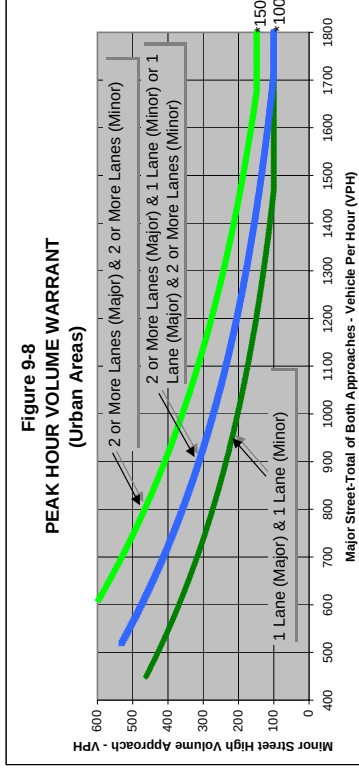
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1470	88	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



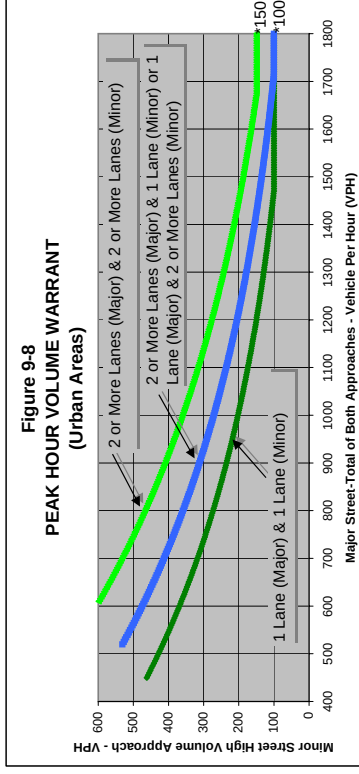
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1238	607	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



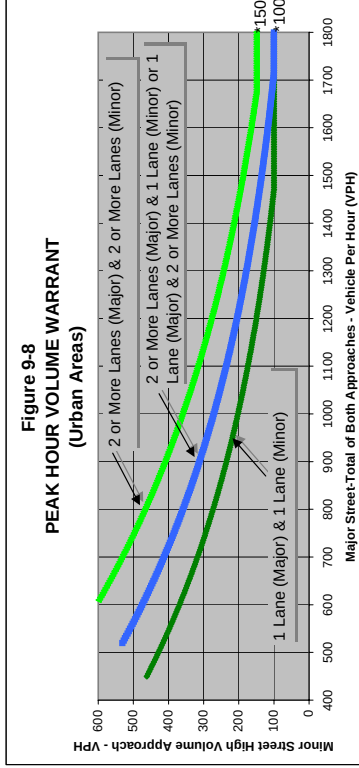
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1136	635	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



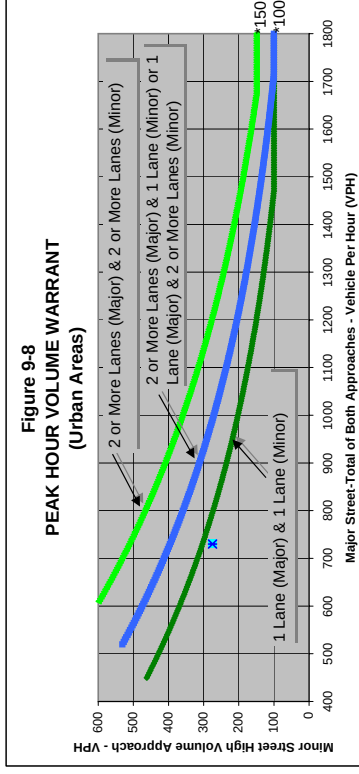
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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		990	87	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



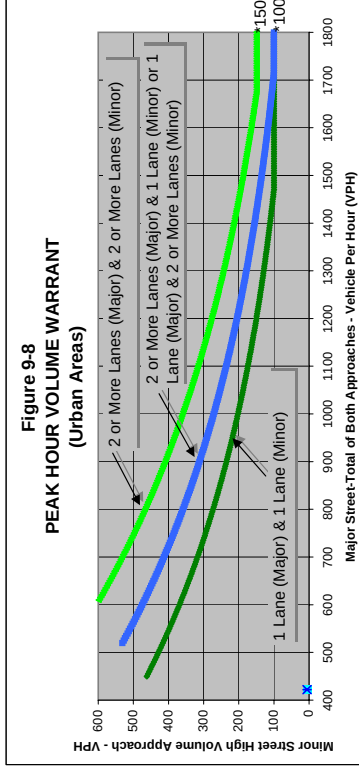
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		730	275	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



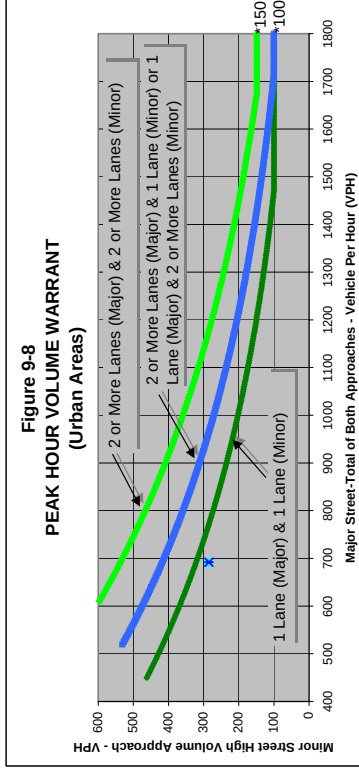
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		422	6	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



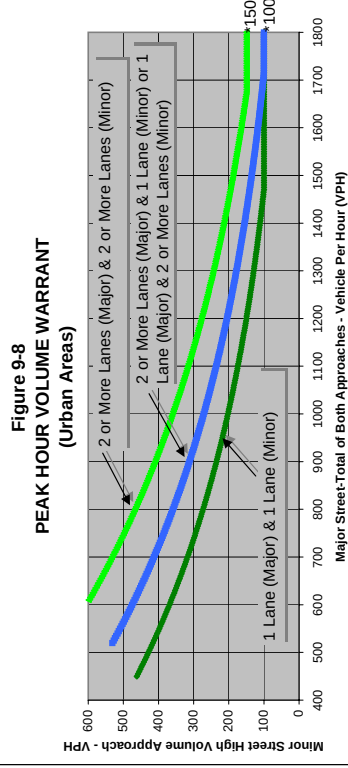
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		692	285	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



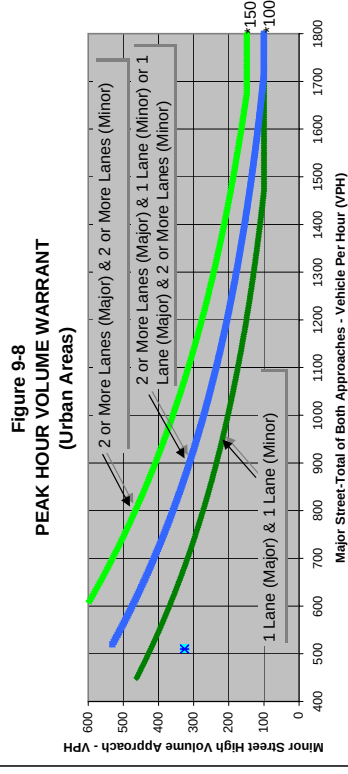
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		676	62	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

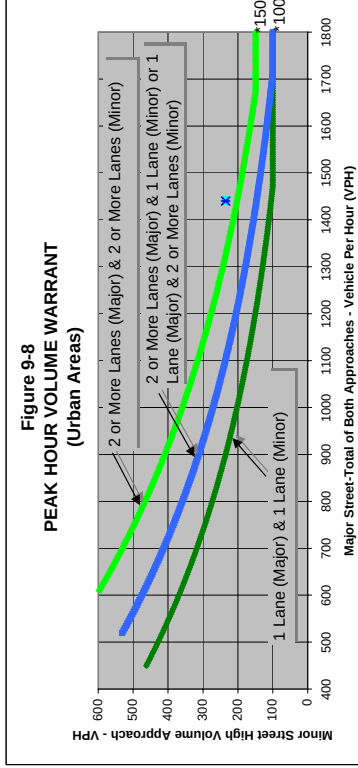
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		510	326	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

CUMULATIVE NO PROJECT CONDITIONS



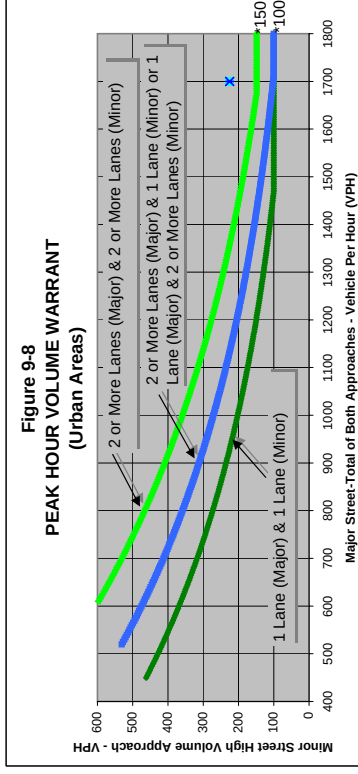
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1440	235	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



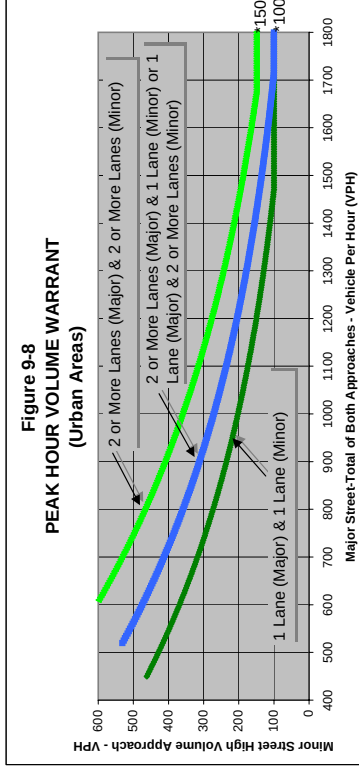
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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1700	225	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



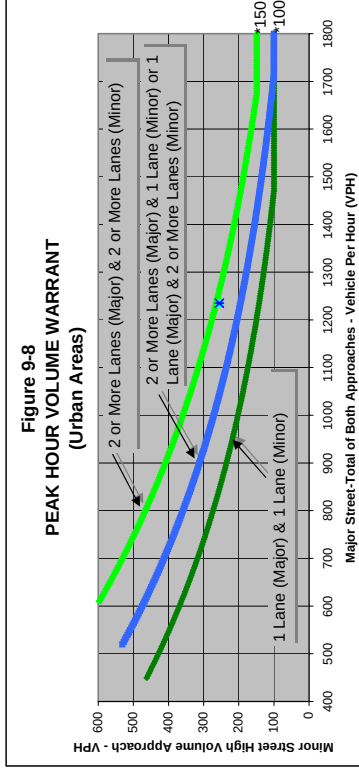
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1675	425	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



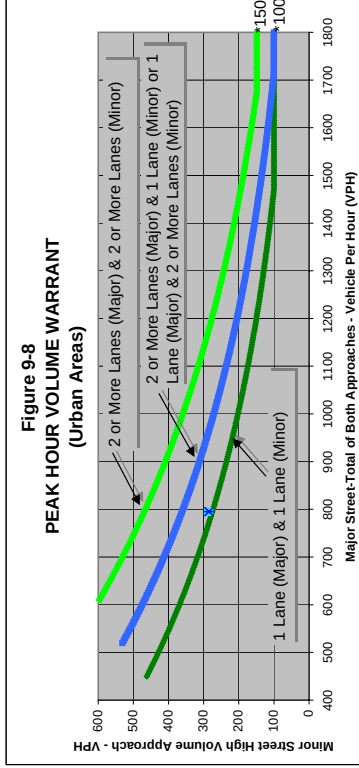
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1235	255	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



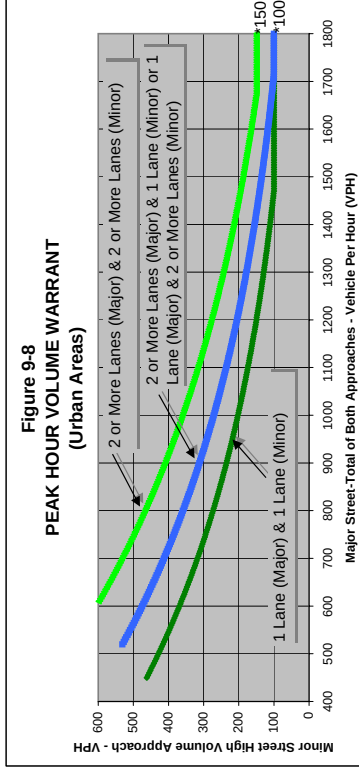
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		795	285	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



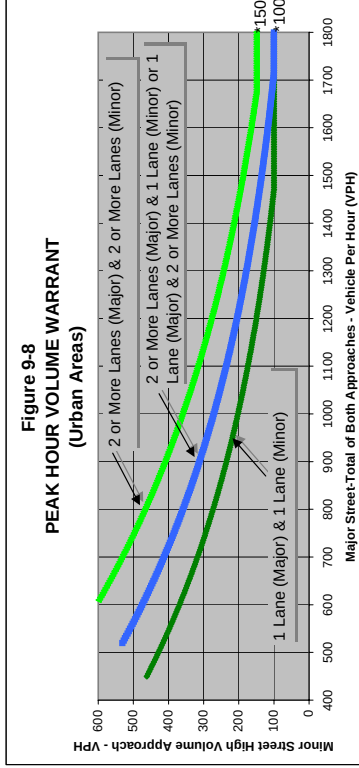
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		385	185	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



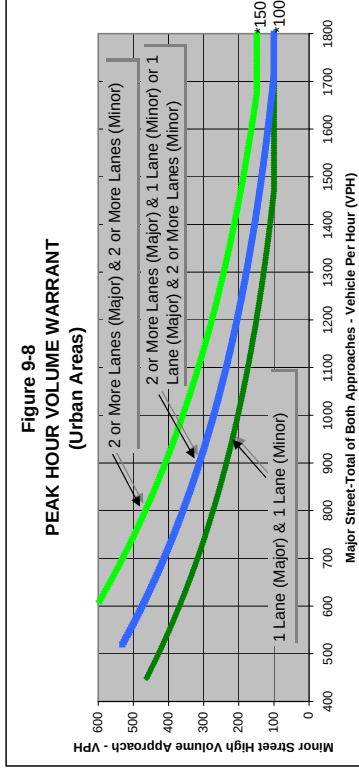
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		180	5	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



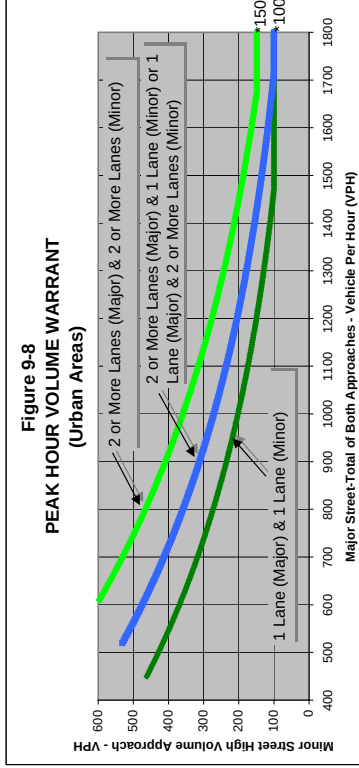
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		245	20	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



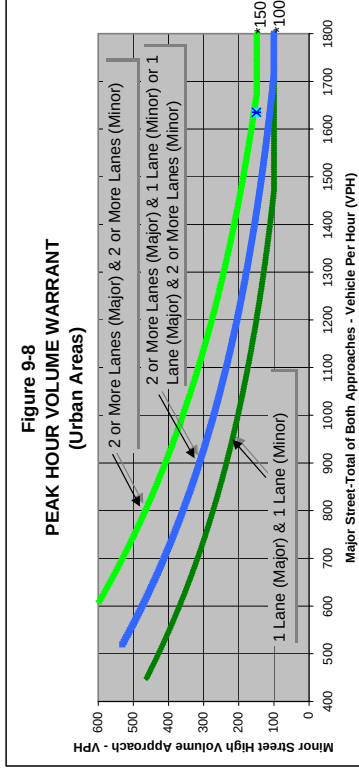
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		20	5	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



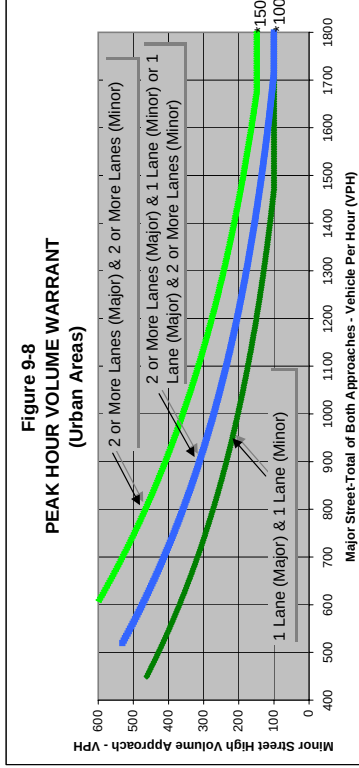
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1635	150	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



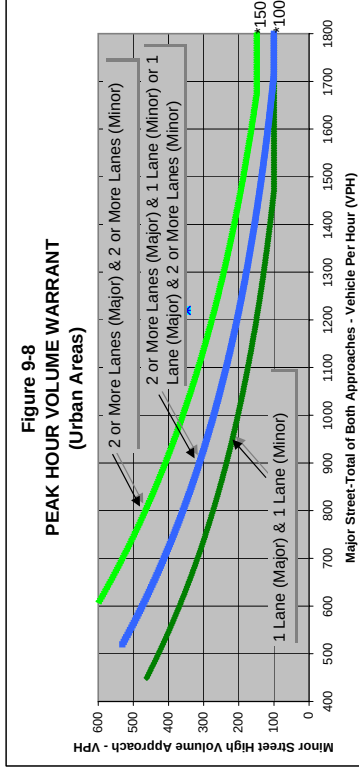
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1550	380	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



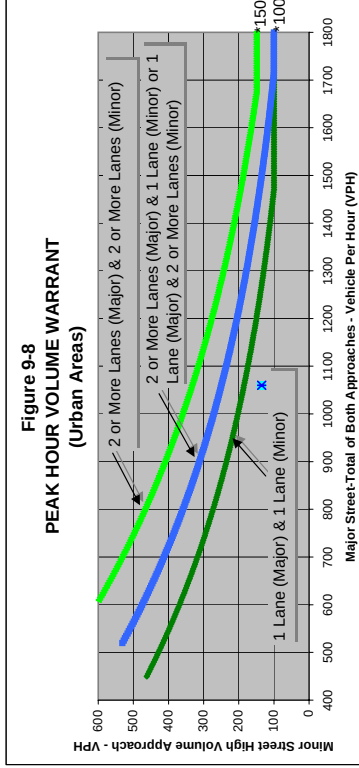
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1220	350	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



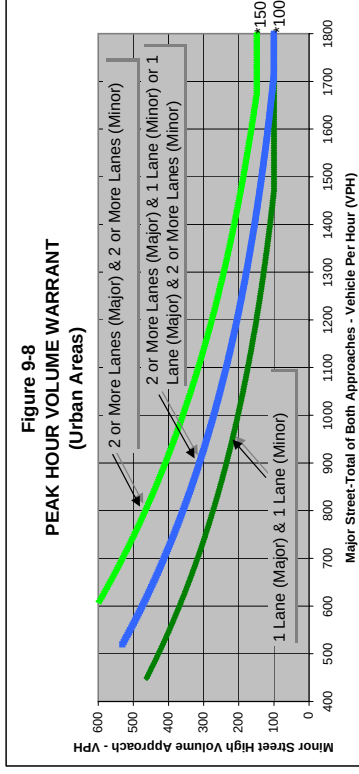
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1060	135	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



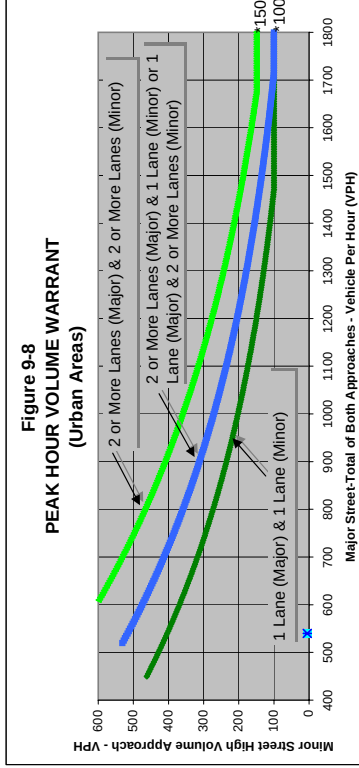
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		385	140	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



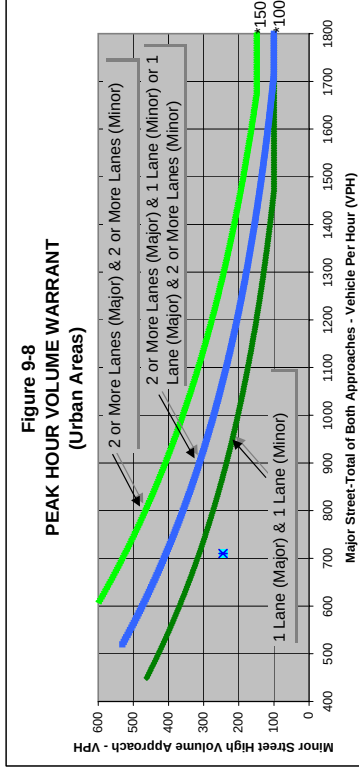
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		540	5	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



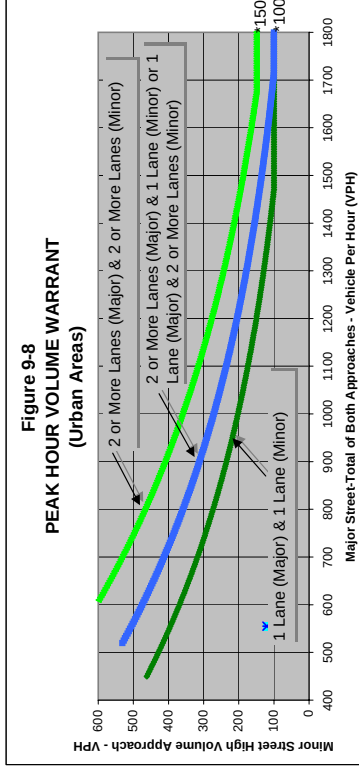
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		710	245	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



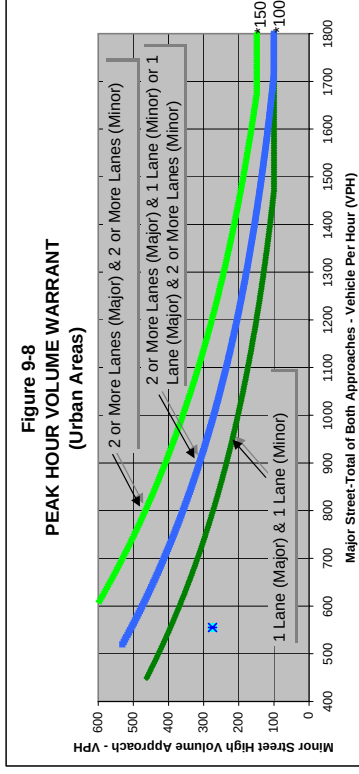
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		555	120	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



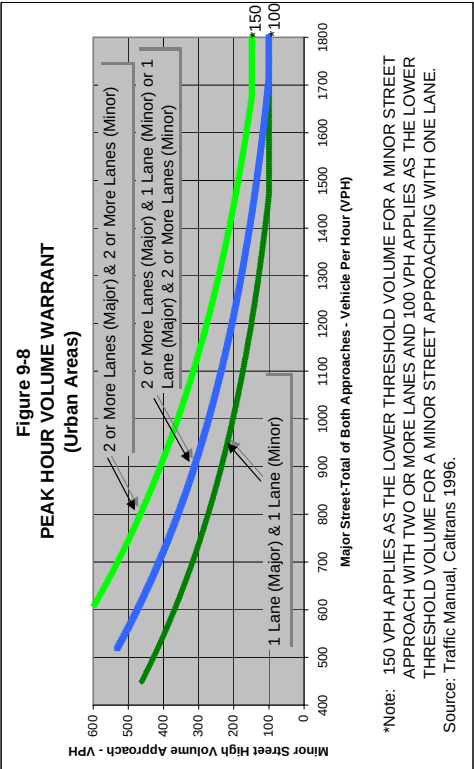
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

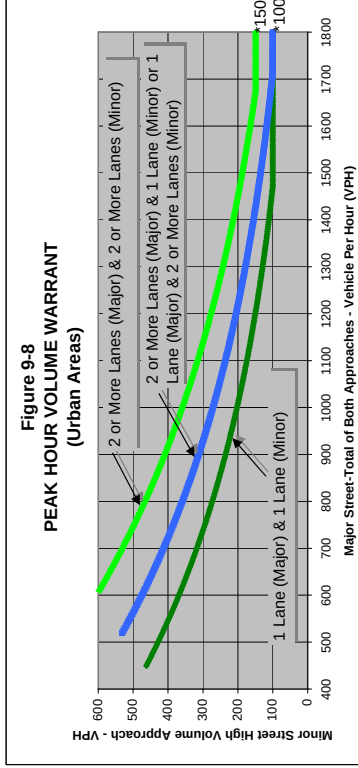
Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		555	275	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		350	325	
*Note: Traffic Volume for Major Street is Total Volume of Both Approaches. Traffic Volume for Minor Street is the Volume of High Volume Approach.				

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☒ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions



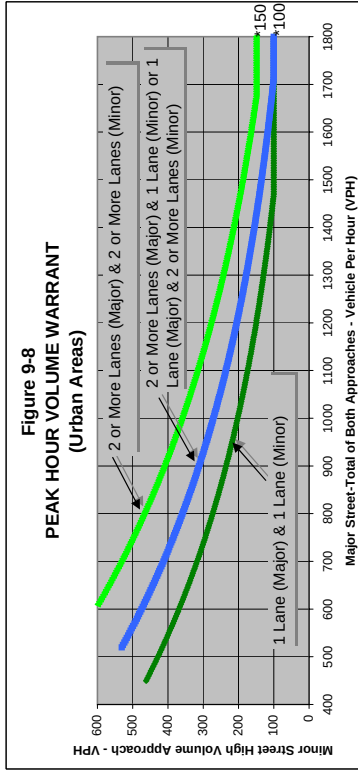
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		2095	115	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



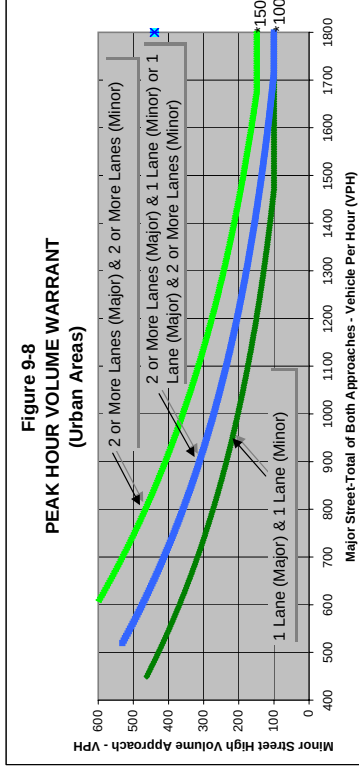
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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1865	335	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



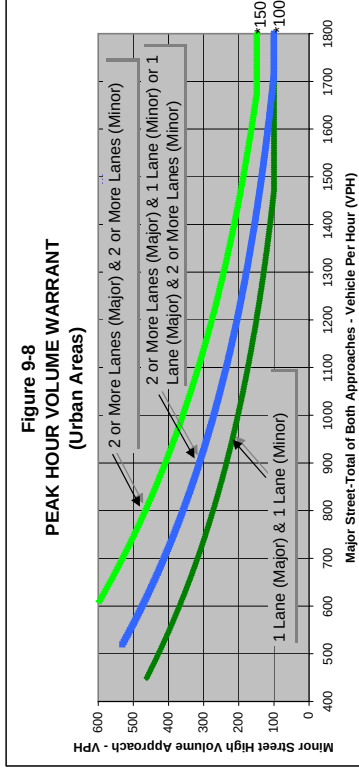
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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1800	440	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



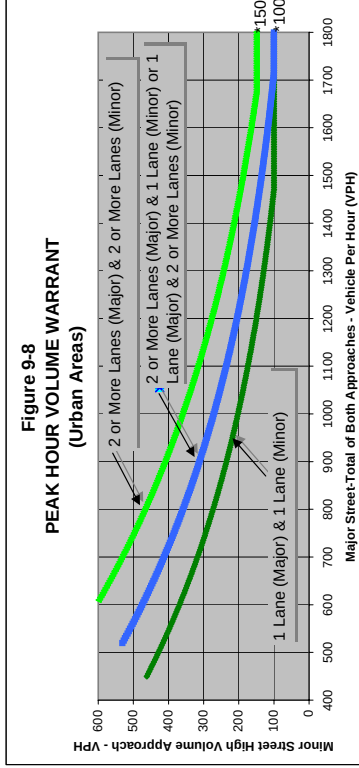
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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1495	575	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



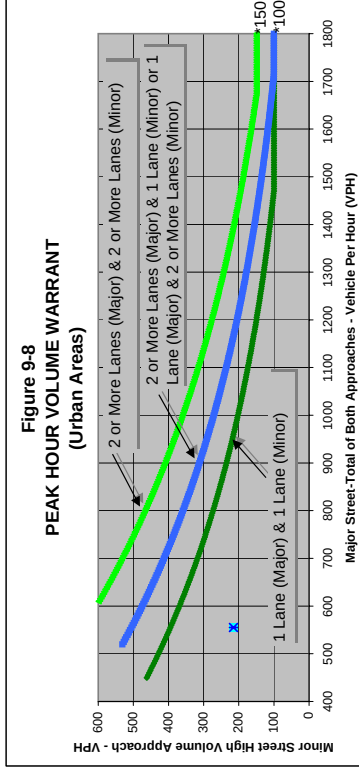
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1055	425	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



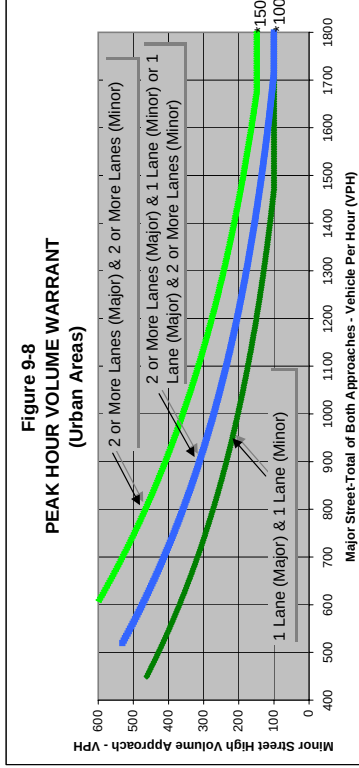
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		555	215	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



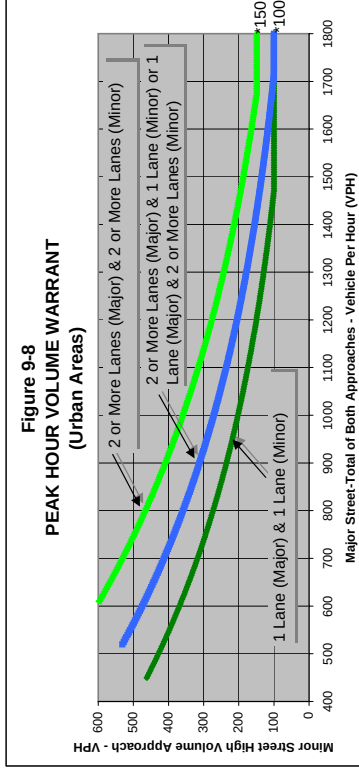
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		290	30	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



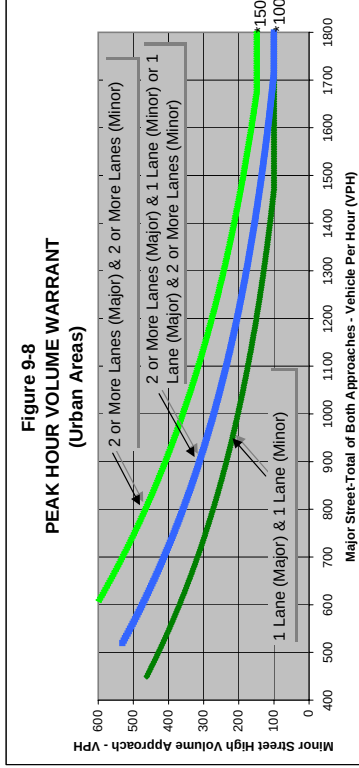
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		380	50	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



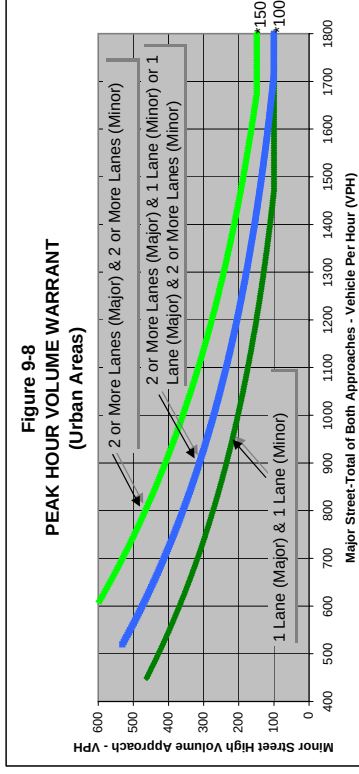
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		60	5	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



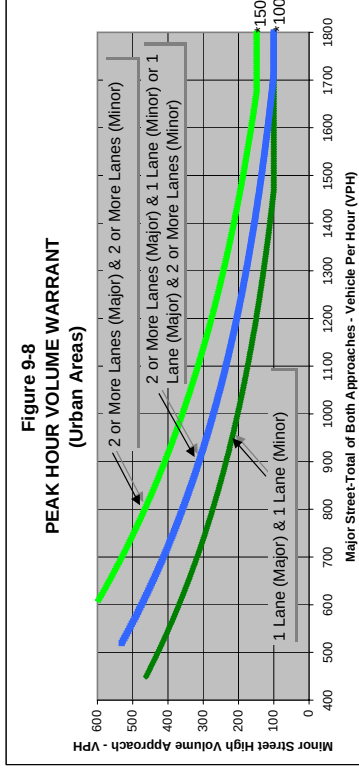
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		2235	210	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



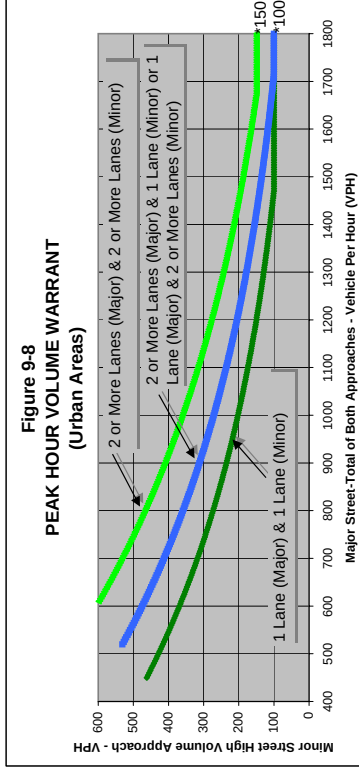
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		2255	395	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



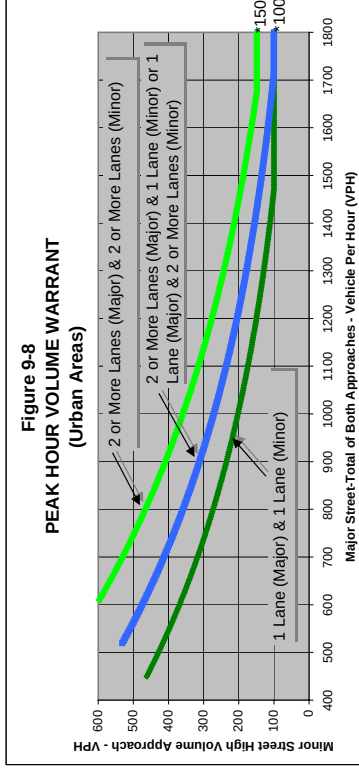
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1805	650	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



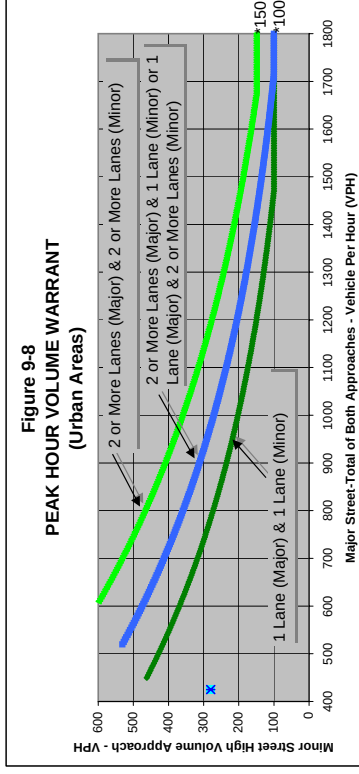
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		965	630	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



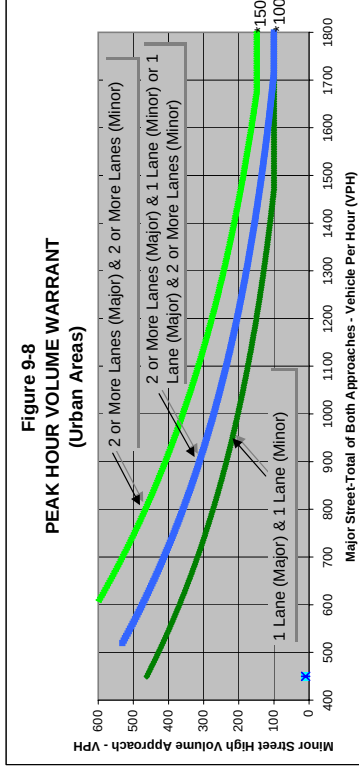
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		425	280	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



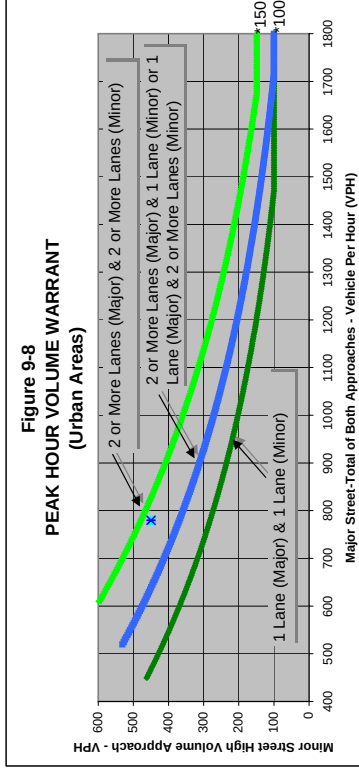
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	<u>NO</u>
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		450	10	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



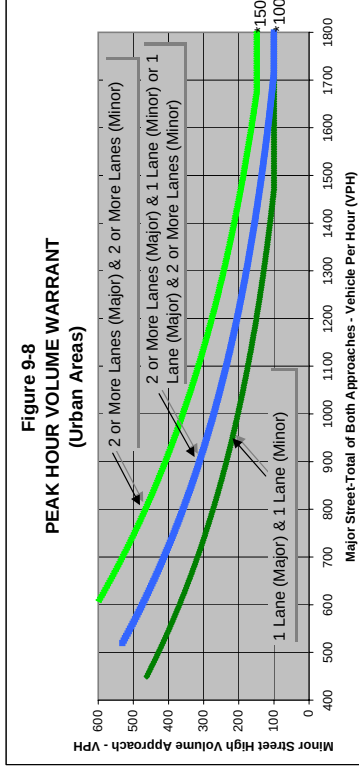
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	<u>YES</u>
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		780	450	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



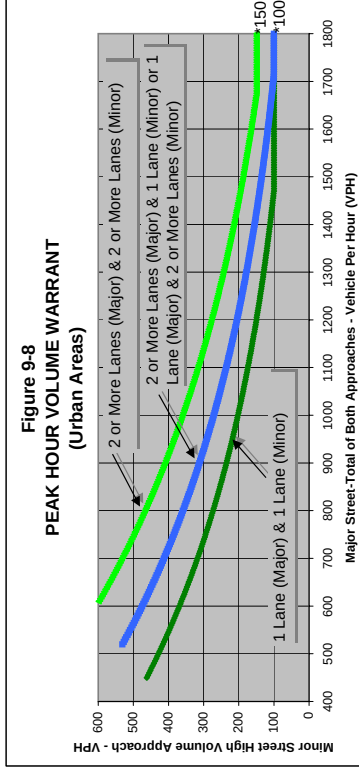
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		885	95	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



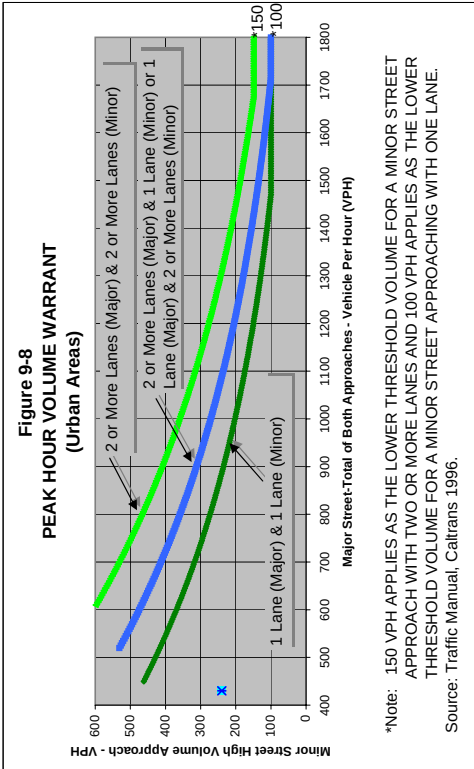
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Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		710	665	

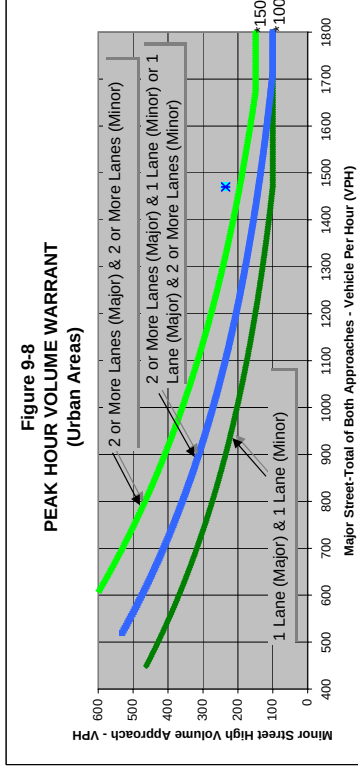
*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		430	240	
*Note: Traffic Volume for Major Street is Total Volume of Both Approaches. Traffic Volume for Minor Street is the Volume of High Volume Approach.				

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☒ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

CUMULATIVE WITH PROJECT CONDITIONS



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

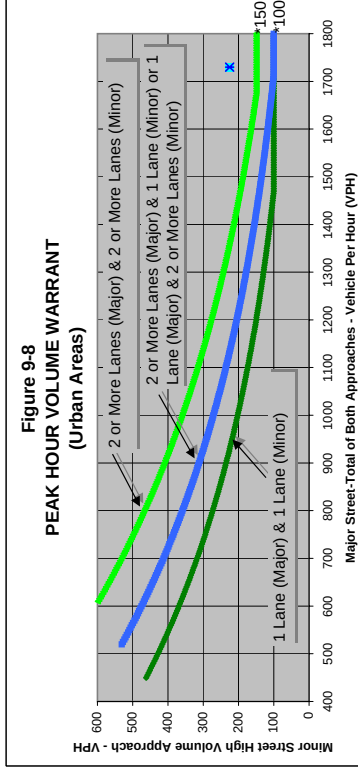
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1470	235	

*Note: Traffic Volume for Minor Street is Total Volume of Both Approaches.

Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

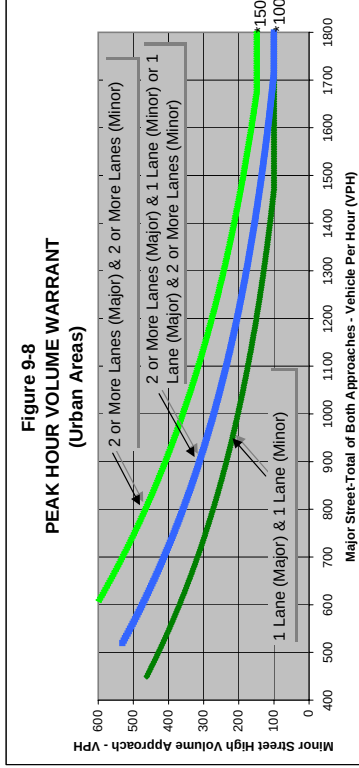
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1730	225	

*Note: Traffic Volume for Minor Street is Total Volume of Both Approaches.

Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



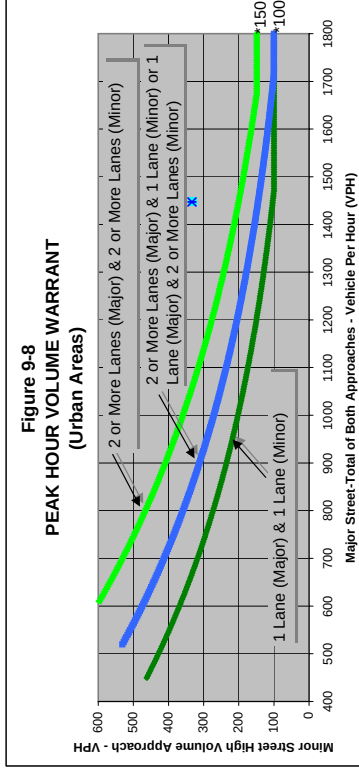
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1887	425	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



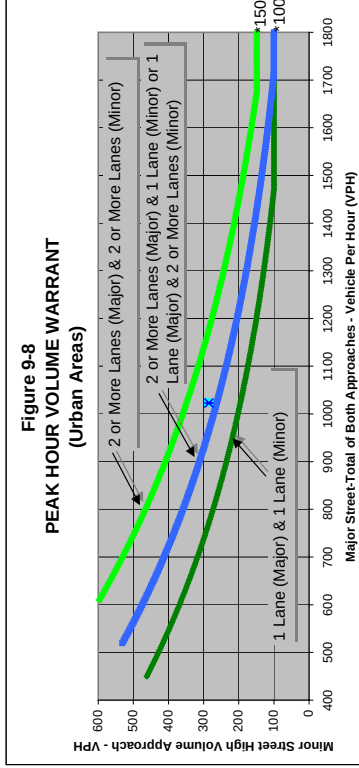
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1447	333	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



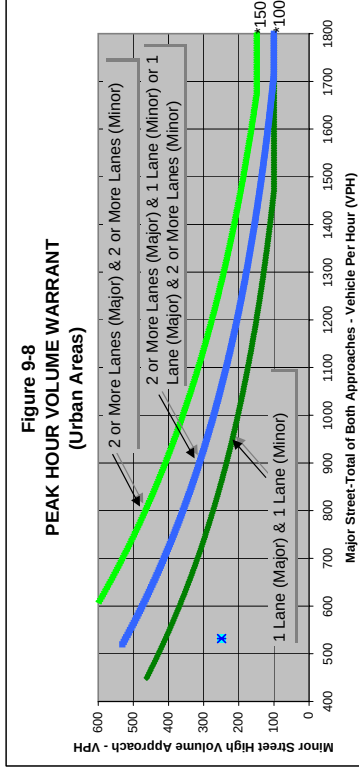
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1023	285	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



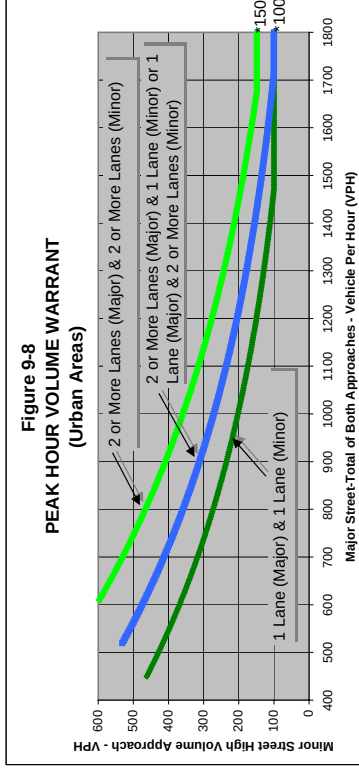
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		532	249	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

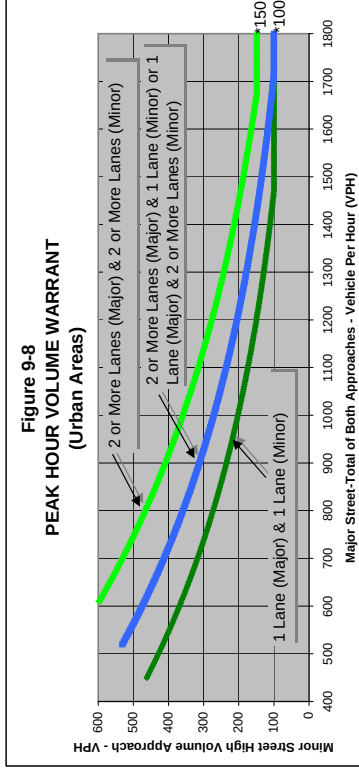
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		182	9	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.

Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

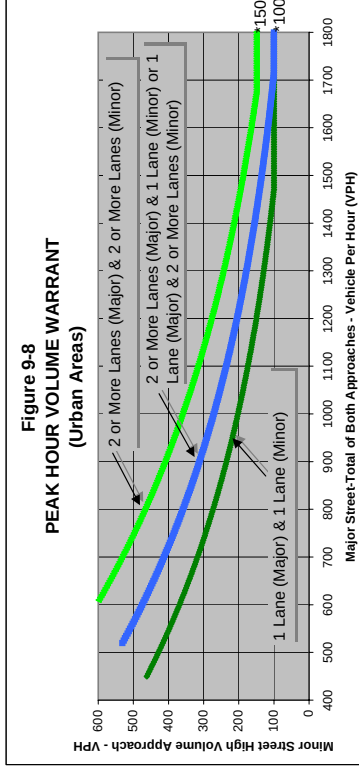
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		396	218	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.

Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



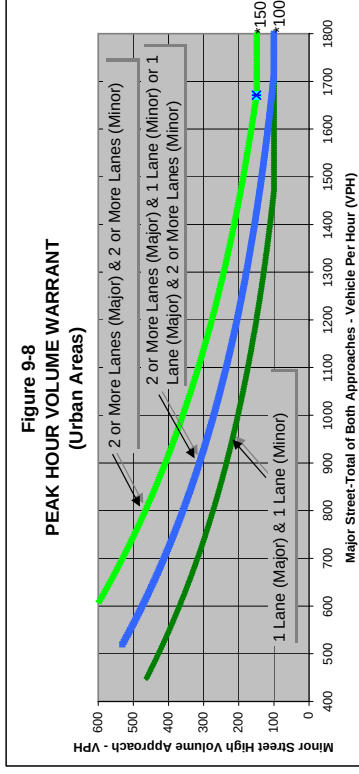
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		22	5	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



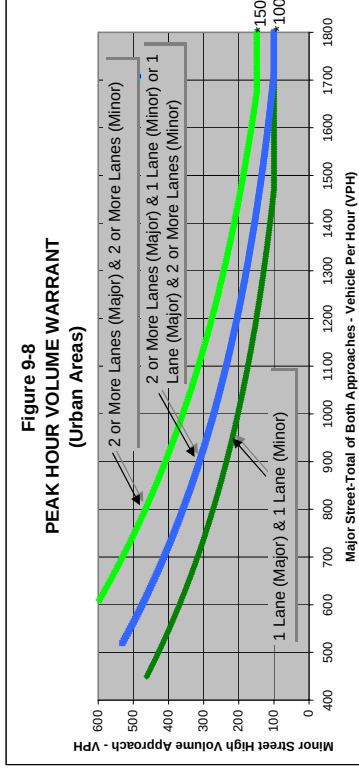
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1671	150	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



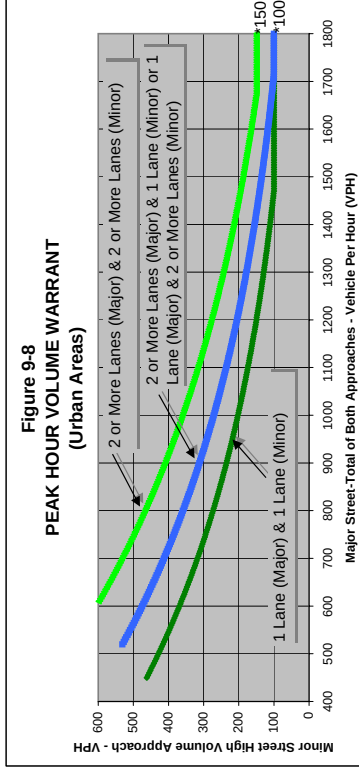
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1708	477	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



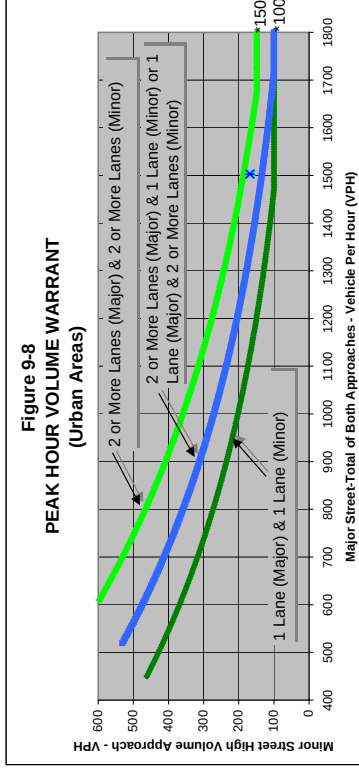
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1703	402	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



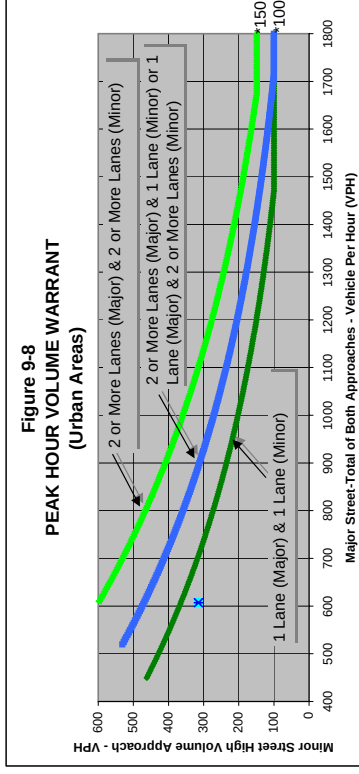
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1503	168	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



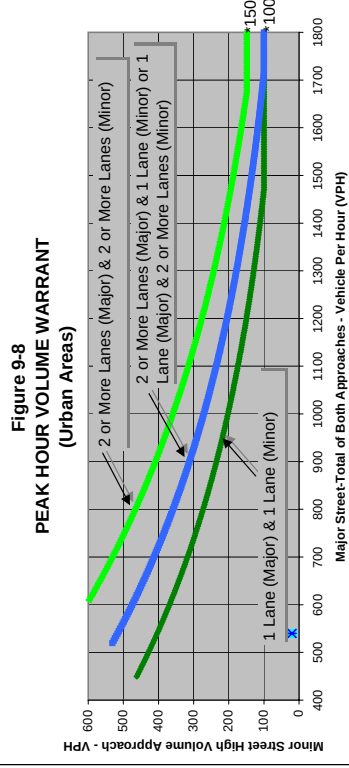
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		607	315	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



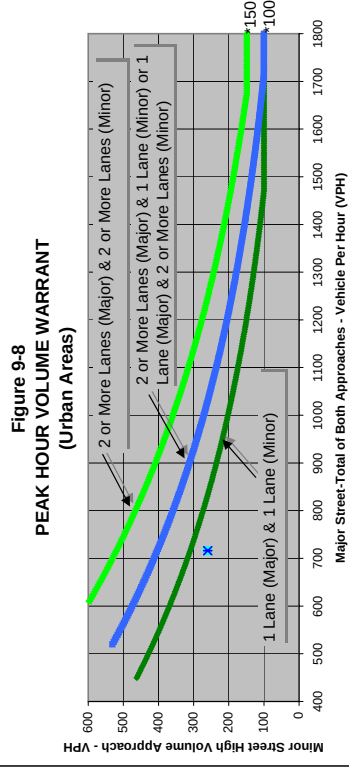
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		540	20	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



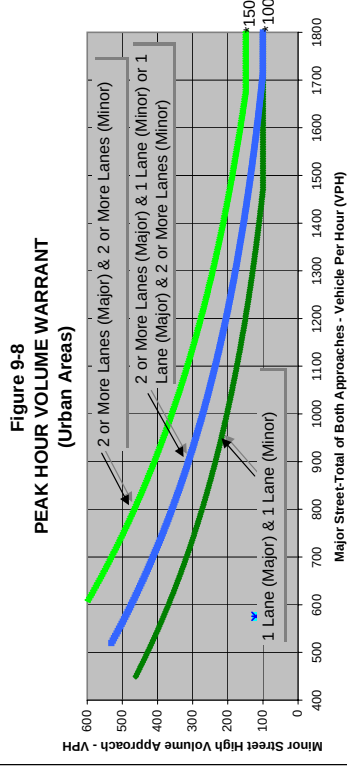
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		716	260	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



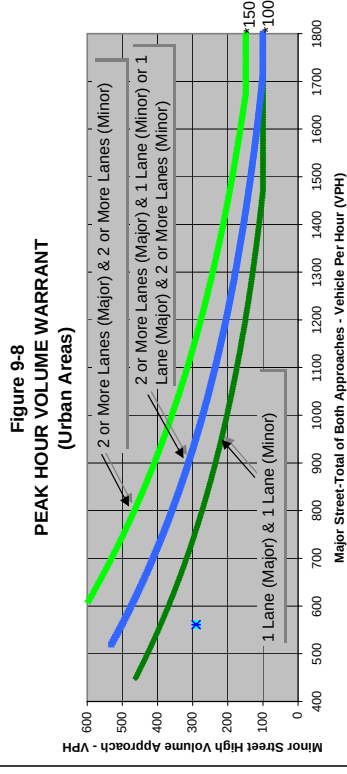
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		576	120	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



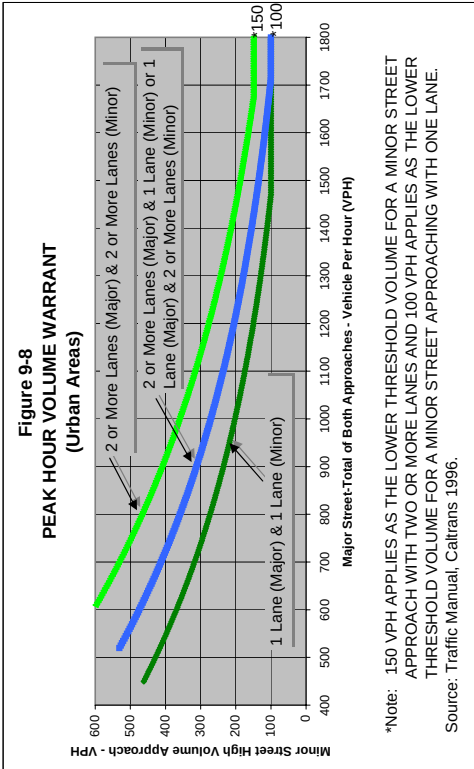
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		561	290	

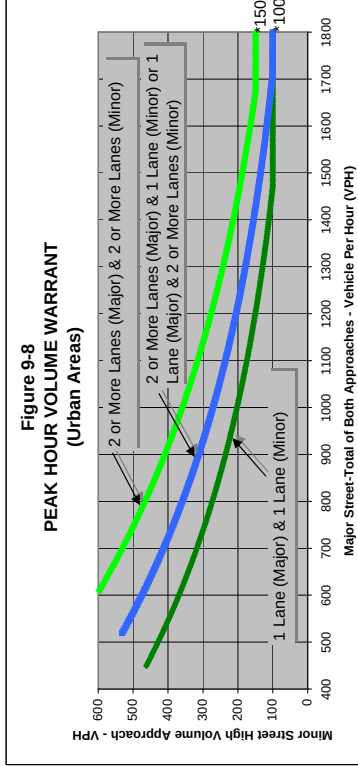
*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		350	331	
*Note: Traffic Volume for Major Street is Total Volume of Both Approaches. Traffic Volume for Minor Street is the Volume of High Volume Approach.				

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



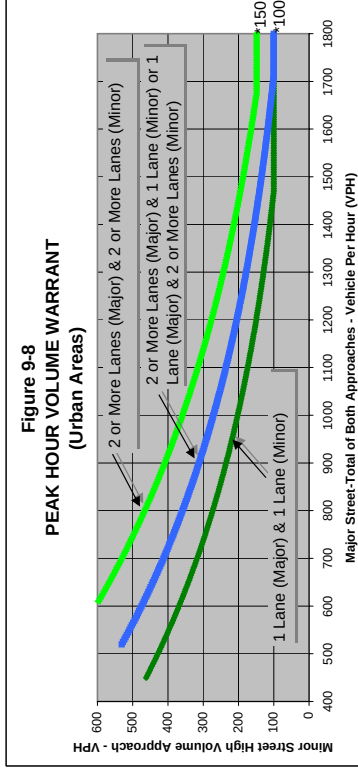
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		2135	115	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



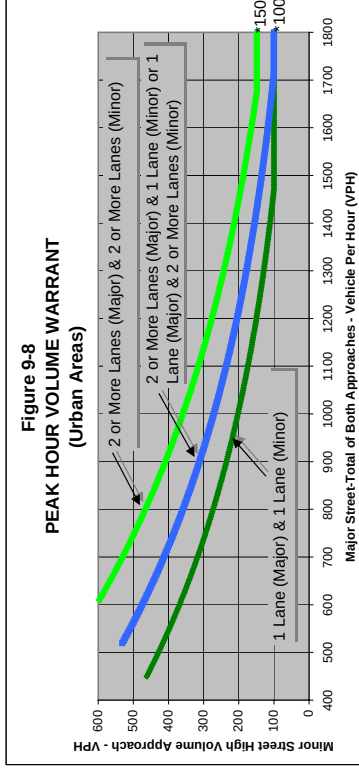
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1905	335	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



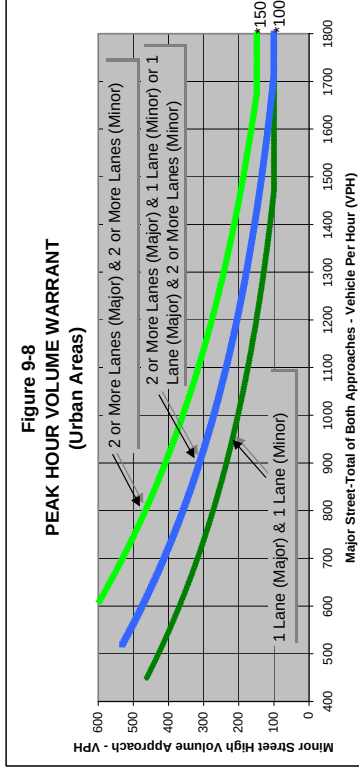
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1981	440	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



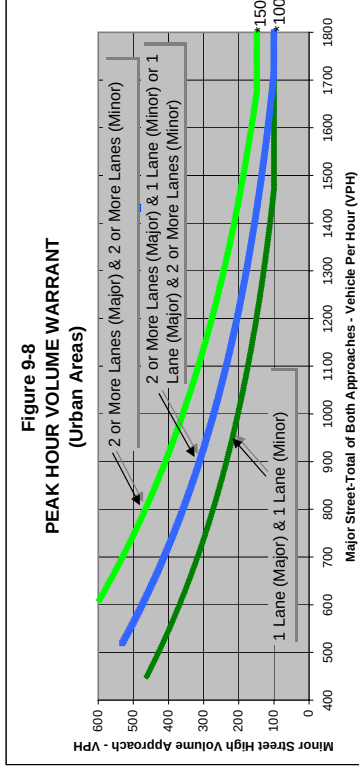
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1676	783	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



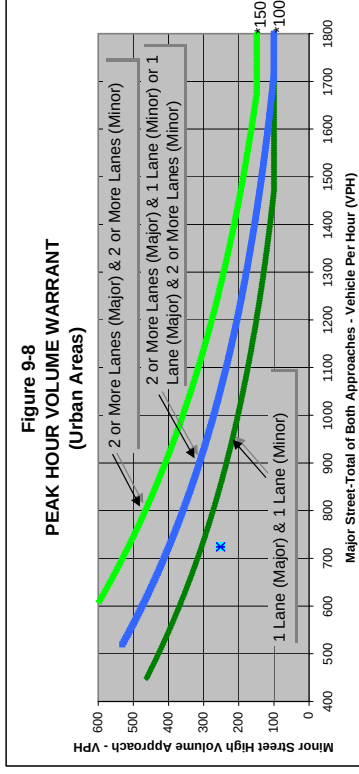
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1432	472	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



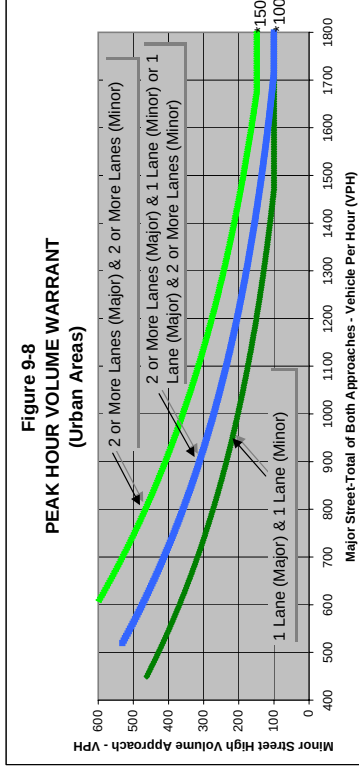
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		724	252	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



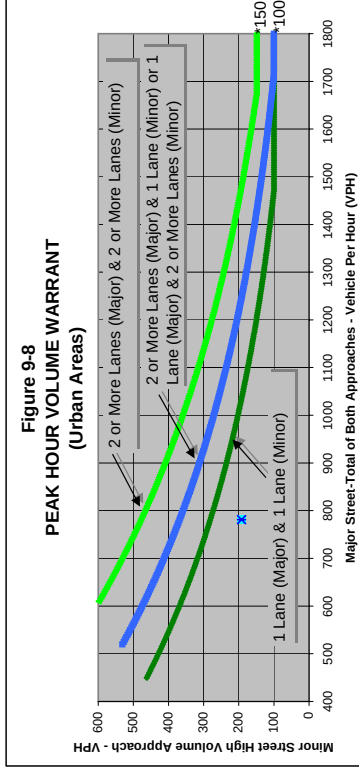
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		294	33	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



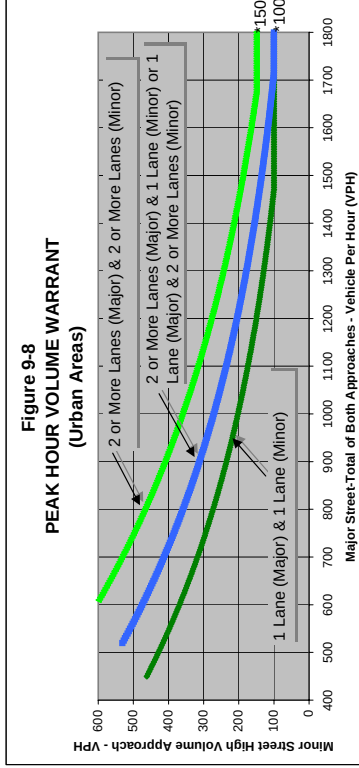
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		781	192	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

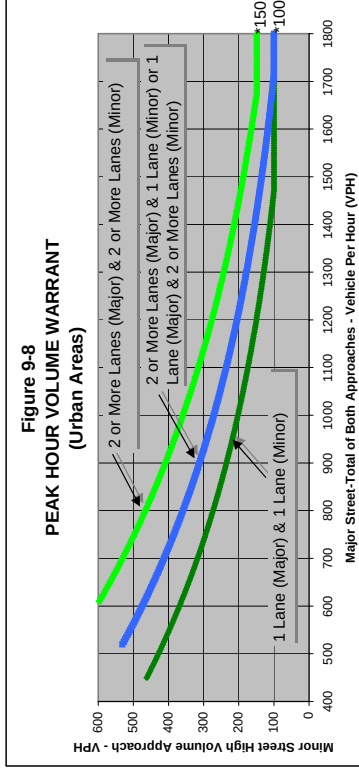
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		64	5	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.

Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

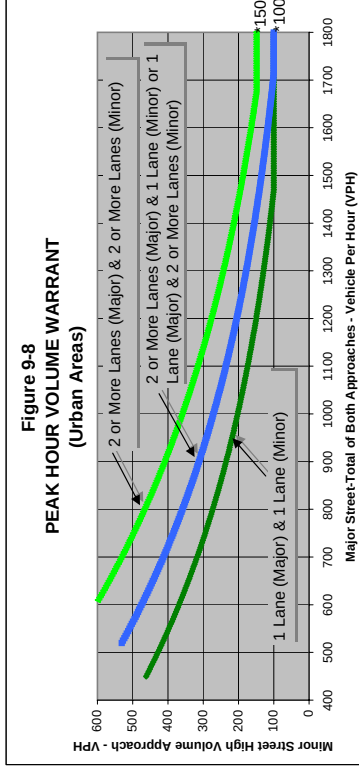
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		2283	210	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.

Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



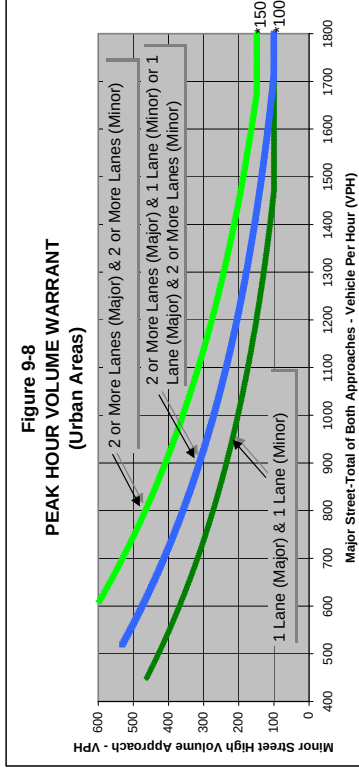
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		2397	655	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



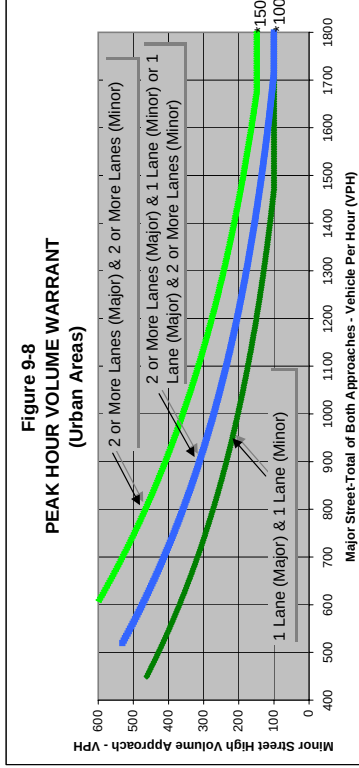
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		2383	789	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



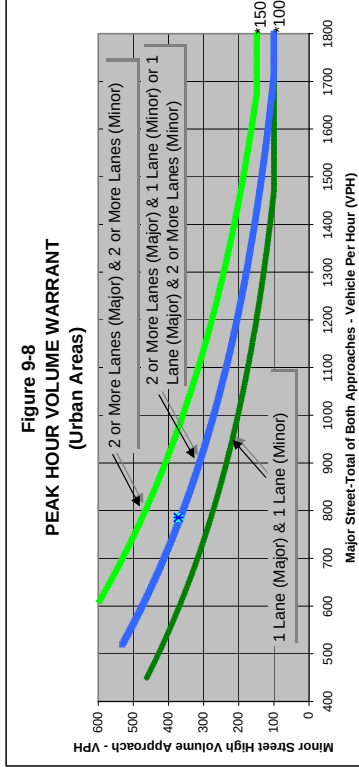
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1603	630	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



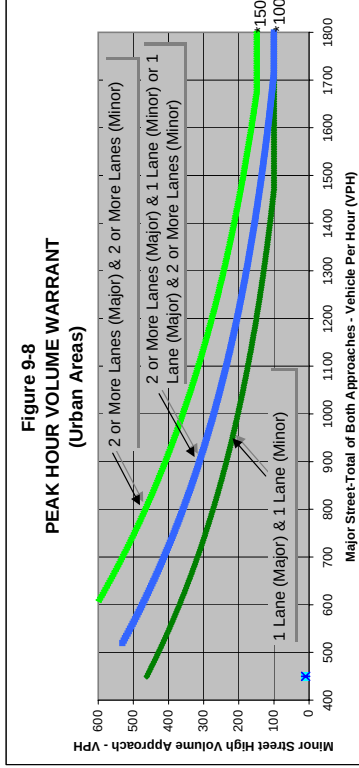
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		786	372	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



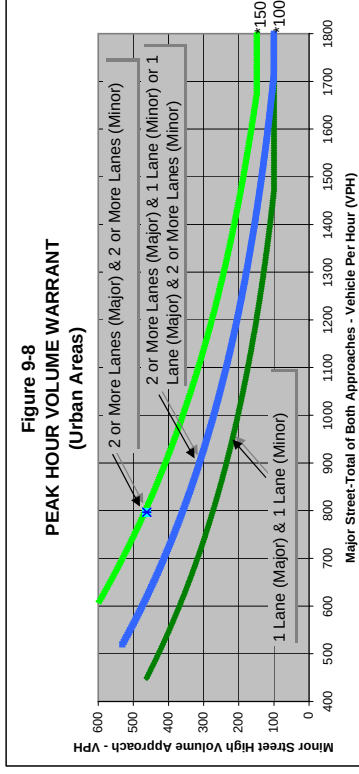
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		450	10	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



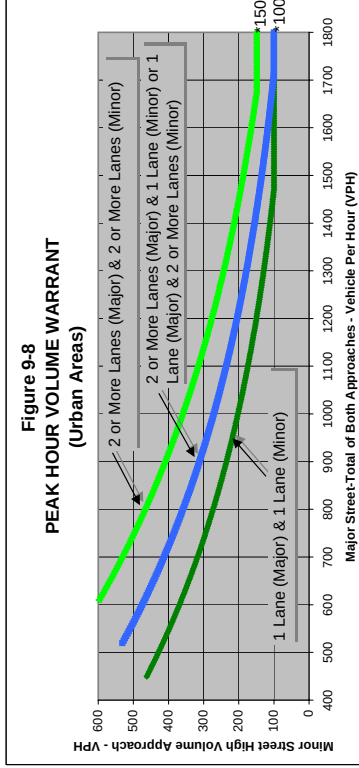
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		797	462	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

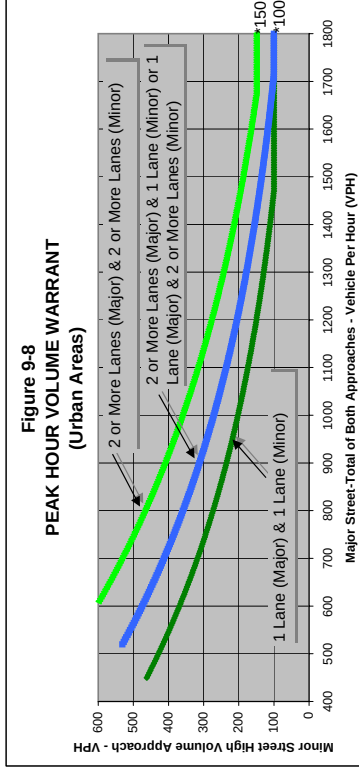
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		914	65	

*Note: Traffic Volume for Minor Street is Total Volume of Both Approaches.

Traffic Volume for Major Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

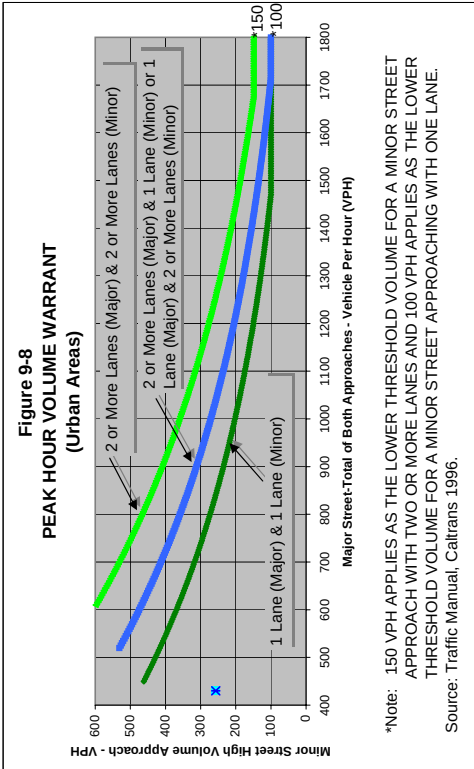
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		727	677	

*Note: Traffic Volume for Minor Street is Total Volume of Both Approaches.

Traffic Volume for Major Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		430	257	
*Note: Traffic Volume for Major Street is Total Volume of Both Approaches. Traffic Volume for Minor Street is the Volume of High Volume Approach.				

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

APPENDIX D:
FREEWAY LEVEL OF SERVICE CALCULATIONS

EXISTING CONDITIONS

HCS+: Basic Freeway Segments Release 5.2

Level of service, LOS

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst:	Fehr & Peers
Agency or Company:	Fehr & Peers
Date Performed:	2/17/2006
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	SR 120 Eastbound
From/To:	Airport to Y
Jurisdiction:	Manteca/San Joaquin
Analysis Year:	2005 Existing
Description:	Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	1688	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	469	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	985	pc/h/

Speed Inputs and Adjustments.

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, FLW	0.0	mi/h
Lateral clearance adjustment, FLC	0.0	mi/h
Interchange density adjustment, FID	2.5	mi/h
Number of lanes adjustment, FN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban	Freeway

LOS and Performance Measures

Flow rate, vp	985	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	17.0	pc/mi/ln

HCS+: Basic Freeway Segments Release 5.2

Level of service, LOS

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	3125	veh/h
Peak-hour factor, P _H F	0.90	
Peak 15-min volume, v ₁₅	868	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, E _T	1.5	
Recreational vehicle PCE, E _R	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	
Driver population factor, f _p	1.00	
Flow rate, v _p	1823	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, FLW	0.0	mi/h
Lateral clearance adjustment, FLC	0.0	mi/h
Interchange density adjustment, FID	2.5	mi/h
Number of lanes adjustment, FN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban	Freeway

LOS and Performance Measures

Flow rate, vp	1823	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.8	mi/h
Number of lanes, N	2	
Density, D	31.6	pc/mi/ln

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	1737	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	483	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level		%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1013	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
FFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1013	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	17.5	pc/mi/ln

Level of service, LOS

B

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	2905	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	807	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Grade	Level	%
Segment length	0.00	mi
Trucks and buses PCE, ET	0.00	
Recreational vehicle PCE, ER	1.5	
Heavy vehicle adjustment, fHV	1.2	
Driver population factor, fp	0.952	
Flow rate, vp	1.00	pc/h/ln
	1695	

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
Lane width adjustment, fLW	65.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	2.5	mi/h
Free-flow speed, FFS	4.5	mi/h
	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1695	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	29.2	pc/mi/ln

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	1848	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	513	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level		%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1078	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1078	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	18.6	pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	2653	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	737	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level		%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1548	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
FFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1548	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	26.7	pc/mi/ln

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	2869	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	797	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level		%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1674	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
FFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1674	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	28.9	pc/mi/ln

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	2177	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	605	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level	Level	%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1270	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
FFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1270	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	21.9	pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	2987	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	830	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level		%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1742	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
Lane width adjustment, fLW	65.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	2.5	mi/h
Free-flow speed, FFS	4.5	mi/h
Urban Freeway	58.0	mi/h

LOS and Performance Measures

Flow rate, vp	1742	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	30.1	pc/mi/ln

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	1986	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	552	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level		%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1159	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
FFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1159	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	20.0	pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

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Level of service, LOS

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

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Operational Analysis_____

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments_____

Volume, V	3274	veh/h
Peak-hour factor, P _H F	0.90	
Peak 15-min volume, v ₁₅	909	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, E _T	1.5	
Recreational vehicle PCE, E _R	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	
Driver population factor, f _p	1.00	
Flow rate, v _p	1910	pc/h/ln

Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban	Freeway

LOS and Performance Measures

Flow rate, vp	1910	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.3	mi/h
Number of lanes, N	2	
Density, D	33.3	pc/mi/ln

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1688 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 156 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 205 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1688	156	205
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	469	43	57
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 1969 182 239 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ 1.000 Using Equation 0
 $V = v + (v - v) P = 1969$ pc/h
12 R F R FD

Capacity Checks

	Actual 1969	Maximum 4700	LOS F?
$V = v$			
$V_i F$	1969	4400	No
V_{12}	1787	4700	No
$V_{FO} F R$	182	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 12.2$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.444$
Space mean speed in ramp influence area, $S = 54.8$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.8$ mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3125 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 439 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 219 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	3125	439	219
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	868	122	61
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3646 512 256
poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 3646$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	3646	4700	No
$F_i F$	3646	4400	No
$v = v - v$	3134	4700	No
$FO F R$	512	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 26.6$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.474$
S
Space mean speed in ramp influence area, $S = 54.1$ mph
R
Space mean speed in outer lanes, $S = N/A$ mph
0
Space mean speed for all vehicles, $S = 54.1$ mph

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_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1532 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 205 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 156 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1532	205	156 vph
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	426	57	43 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 1787 239 182 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 1787 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	2026	4700	No
FO			
V	2026	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v_R + 0.0078 v₁₂ - 0.00627 L_A = 14.9 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B

_____ Speed Estimation _____

Intermediate speed variable, M = 0.281
Space mean speed in ramp influence area, S = 58.5 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 58.5 mph

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Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2686 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 219 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 439 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components
Volume, V (vph) 2686 219 439 vph
Peak-hour factor, PHF 0.90 0.90 0.90
Peak 15-min volume, v15 746 61 122 v
Trucks and buses 10 10 10 %
Recreational vehicles 0 0 0 %
Terrain type: Level Level Level
Grade % mi
Length 1.5 1.5 1.5 mi
Trucks and buses PCE, ET 1.2 1.2 1.2
Recreational vehicle PCE, ER

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3134 256 512 poph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 3134 pc/h
12 F FM

Capacity Checks

v Actual Maximum LOS F?
FO 3390 4700 No
v 3390 4600 No
R12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 25.5 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.367
Space mean speed in ramp influence area, S = 56.6 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 56.6 mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1737 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 132 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 243 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1737	132	243
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	483	37	68
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2027 154 284 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ 1.000 Using Equation 0
 $V = v + (v - v) P = 2027$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2027	4700	No
V_{12}	2027	4400	No
$V = v - v$	1873	4700	No
V_{FO}	154	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 12.7$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.442$
Space mean speed in ramp influence area, $S = 54.8$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.8$ mph

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Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2905 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 496 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 244 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2905	496	244
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	807	138	68
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3389 579 285 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ Using Equation 0
 $V = v + (v - v) P = 3389$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	3389	4700	No
$V_{12} F$	3389	4400	No
$V = v - v$	2810	4700	No
$V_{FO} F R$	579	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 24.4$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.480$
Space mean speed in ramp influence area, $S = 54.0$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.0$ mph

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Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1605 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 243 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 132 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components
Volume, V (vph) 1605 243 132 1605
Peak-hour factor, PHF 0.90 0.90 0.90 0.90
Peak 15-min volume, v15 446 68 37 446
Trucks and buses 10 10 10 10
Recreational vehicles 0 0 0 0
Terrain type: Level Level Level Level
Grade % % % %
Length mi mi mi mi
Trucks and buses PCE, ET 1.5 1.5 1.5 1.5
Recreational vehicle PCE, ER 1.2 1.2 1.2 1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00 1.00
Flow rate, vp 1873 284 154 154

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 1873 pc/h
12 F FM

Capacity Checks

v Actual Maximum LOS F?
FO 2157 4700 No
v 2157 4600 No
R12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 15.9 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.285
Space mean speed in ramp influence area, S = 58.5 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 58.5 mph

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Phone:
E-mail:

Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2409 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 244 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 496 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2409	244	496
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	669	68	138
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2811 285 579 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 2811 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	3096	4700	No
FO			
V	3096	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v_R + 0.0078 v₁₂ - 0.00627 L_A = 23.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C

_____ Speed Estimation _____

Intermediate speed variable, M = 0.337
Space mean speed in ramp influence area, S = 57.2 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 57.2 mph

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Phone:
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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2987 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 209 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 496 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2987	209	496
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	830	58	138
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3485 244 579 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 3485$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	3485	4700	No
$F_i F$	3485	4400	No
$v = v - v$	3241	4700	No
$FO F R$	244	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 25.2$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.450$
Space mean speed in ramp influence area, $S = 54.7$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.7$ mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1986 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 230 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 212 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1986	230	212
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	552	64	59
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2317 268 247 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 2317$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2317	4700	No
$F_i F$	2317	4400	No
$v = v - v$	2049	4700	No
$FO F R$	268	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 15.2$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.452$
Space mean speed in ramp influence area, $S = 54.6$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.6$ mph

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_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis
Number of lanes in freeway Merge
Free-flow speed on freeway 65.0 mph
Volume on freeway 2778 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 496 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 209 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2778	496	209
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	772	138	58
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3241 579 244 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 3241 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	3820	4700	No
FO			
V	3820	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v_R + 0.0078 v₁₂ - 0.00627 L_A = 28.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D

_____ Speed Estimation _____

Intermediate speed variable, M = 0.429
Space mean speed in ramp influence area, S = 55.1 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 55.1 mph

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_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis _____ Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1756 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 212 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane _____ ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 230 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1756	212	230
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	488	59	64
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2049 247 268 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 2049 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	2296	4700	No
FO			
V	2296	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v_R + 0.0078 v₁₂ - 0.00627 L_A = 17.0 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B

_____ Speed Estimation _____

Intermediate speed variable, M = 0.290
Space mean speed in ramp influence area, S = 58.3 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 58.3 mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2869 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 271 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 389 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2869	271	389
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	797	75	108
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3347 316 454 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 3347$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	3347	4700	No
$F_i F$	3347	4400	No
$v = v - v$	3031	4700	No
$FO F R$	316	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 24.0$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.456$
Space mean speed in ramp influence area, $S = 54.5$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.5$ mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2177 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 347 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 156 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2177	347	156
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	605	96	43
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2540 405 182 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 2540$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2540	4700	No
$F_i F$	2540	4400	No
$v = v - v$	2135	4700	No
$FO F R$	405	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 17.1$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.464$
Space mean speed in ramp influence area, $S = 54.3$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.3$ mph

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_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2598 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 389 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 271 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2598	389	271
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	722	108	75
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3031 454 316
poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 3031 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	3485	4700	No
FO			
V	3485	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 26.2 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence C

_____ Speed Estimation _____

Intermediate speed variable, M = 0.378
Space mean speed in ramp influence area, S = 56.3 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 56.3 mph

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_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: 2005 Existing Conditions
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1830 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 156 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 347 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1830	156	347 vph
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	508	43	96 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2135 182 405 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 2135 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	2317	4700	No
FO			
V	2317	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 17.2 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

_____ Speed Estimation _____

Intermediate speed variable, M = 0.291
Space mean speed in ramp influence area, S = 58.3 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 58.3 mph

PROJECT CONDITIONS

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
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Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 3472 veh/h
Peak-hour factor, PHF 0.90
Peak 15-min volume, v15 964 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 2025 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 2025 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 56.2 mi/h
Number of lanes, N 2
Density, D 36.1 pc/mi/ln

Level of service, LOS E
Overall results are not computed when free-flow speed is less than 55 mph.

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Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	1789	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	497	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level		%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1044	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1044	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	18.0	pc/mi/ln

Level of service, LOS

B

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
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Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	3044	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	846	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level	0.00	%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1776	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1776	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.9	mi/h
Number of lanes, N	2	
Density, D	30.7	pc/mi/ln

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 2076 veh/h
Peak-hour factor, PHF 0.90
Peak 15-min volume, v15 577 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 1211 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 1211 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 58.0 mi/h
Number of lanes, N 2
Density, D 20.9 pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 2829 veh/h
Peak-hour factor, PHF 0.90
Peak 15-min volume, v15 786 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 1650 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 1650 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 58.0 mi/h
Number of lanes, N 2
Density, D 28.4 pc/mi/ln

Level of service, LOS D
Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments	
Volume, V	2966 veh/h
Peak-hour factor, PHF	0.90
Peak 15-min volume, v15	824 v
Trucks and buses	10 %
Recreational vehicles	0 %
Terrain type:	Level
Grade	0.00 %
Segment length	0.00 mi
Trucks and buses PCE, ET	1.5
Recreational vehicle PCE, ER	1.2
Heavy vehicle adjustment, fHV	0.952
Driver population factor, fp	1.00
Flow rate, vp	1730 pc/h/ln

Speed Inputs and Adjustments	
Lane width	12.0 ft
Right-shoulder lateral clearance	6.0 ft
Interchange density	1.00 interchange/mi
Number of lanes, N	2
Free-flow speed:	Base
FFS or BFFS	65.0 mi/h
Lane width adjustment, fLW	0.0 mi/h
Lateral clearance adjustment, fLC	0.0 mi/h
Interchange density adjustment, fID	2.5 mi/h
Number of lanes adjustment, fN	4.5 mi/h
Free-flow speed, FFS	58.0 mi/h
Urban Freeway	

LOS and Performance Measures	
Flow rate, vp	1730 pc/h/ln
Free-flow speed, FFS	58.0 mi/h
Average passenger-car speed, S	58.0 mi/h
Number of lanes, N	2
Density, D	29.8 pc/mi/ln

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments		
Volume, V	2437	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	677	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level	Level	%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1422	pc/h/ln

Speed Inputs and Adjustments		
Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
Lane width adjustment, fLW	65.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	2.5	mi/h
Free-flow speed, FFS	4.5	mi/h
	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures		
Flow rate, vp	1422	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	24.5	pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 3109 veh/h
Peak-hour factor, PHF 0.90
Peak 15-min volume, v15 864 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 1814 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 1814 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 57.8 mi/h
Number of lanes, N 2
Density, D 31.4 pc/mi/ln

Level of service, LOS D
Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Level of service, LOS

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

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Operational Analysis_____

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Fehr & Peers
Fehr & Peers
2/17/2006
PM Peak Hour
SR 120 Westbound
Union to Airfield
Manteca/San Jose
Project Condition
Sundance

Flow Inputs and Adjustments_____

Volume, V	2080	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	578	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1213	pc/h/

2080	Level:
0.90	0.00
578	0.00
10	1.5
0	1.2
	0.95
	1.00
	1213

Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	
Lane width adjustment, fLW	65.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	2.5	mi/h
Free-flow speed, FFS	4.5	mi/h
	58.0	mi/h
	Urban	Freeway

ft
ft
intercha

mi/h
mi/h
mi/h
mi/h
mi/h
mi/h

LOS and Performance Measures

Flow rate, vp	1213	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	20.9	pc/mi/ln

$$\begin{array}{r} 1213 \\ 58.0 \\ 58.0 \\ 2 \\ \hline 20.9 \end{array}$$

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Level of service, LOS

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
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Fax:

Operational Analysis

Analyst:	Fehr & Peers
Agency or Company:	Fehr & Peers
Date Performed:	2/17/2006
Analysis time Period:	AM Peak Hour
Freeway/Direction:	SR 102 Westbound
From/To:	Airport to Y
Jurisdiction:	Manteca/San Joaquin
Analysis Year:	Project Cond.
Description:	Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	3578	veh/h
Peak-hour factor, P _H F	0.90	
Peak 15-min volume, V ₁₅	994	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, E _T	1.5	
Recreational vehicle PCE, E _R	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	
Driver population factor, f _p	1.00	
Flow rate, v _p	2087	pc/h/

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, FLW	0.0	mi/h
Lateral clearance adjustment, FLC	0.0	mi/h
Interchange density adjustment, FID	2.5	mi/h
Number of lanes adjustment, FN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban	Freeway

LOS and Performance Measures

Flow rate, vp	2087	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	55.2	mi/h
Number of lanes, N	2	
Density, D	37.8	pc/mi/ln

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Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 2203 veh/h
Peak-hour factor, PHF 0.90
Peak 15-min volume, v15 612 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 1285 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 1285 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 58.0 mi/h
Number of lanes, N 2
Density, D 22.2 pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Ramps and Ramp Junctions Release 5.2

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1818 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 234 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 205 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1818	234	205
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	505	65	57
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2121 273 239 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ Using Equation 0
 $V = v + (v - v) P = 2121$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2121	4700	No
$V_{12} F$	2121	4400	No
V_{12}	1848	4700	No
$V_{FO} F R$	273	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 13.5$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.453$
Space mean speed in ramp influence area, $S = 54.6$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.6$ mph

HCS+: Ramps and Ramp Junctions Release 5.2

Phone: _____ Fax: _____
E-mail: _____
Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Freeway Data
Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3472 vph

Off Ramp Data
Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 647 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)
Does adjacent ramp exist? Yes
Volume on adjacent ramp 219 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions
Junction Components
Volume, V (vph) 3472 Ramp 647 Adjacent Ramp 219 vph
Peak-hour factor, PHF 0.90 0.90 0.90
Peak 15-min volume, v15 964 180 61 v
Trucks and buses 10 10 10 %
Recreational vehicles 0 0 0 %
Terrain type: Level Level Level
Grade 0.00 % 0.00 % 0.00 %
Length 0.00 mi 0.00 mi 0.00 mi
Trucks and buses PCE, ET 1.5 1.5 1.5
Recreational vehicle PCE, ER 1.2 1.2 1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 4051 755 256 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ 1.000 Using Equation 0
 $V = v + (v - v) P = 4051$ pc/h
12 R F R FD

Capacity Checks

$V = v$ Actual Maximum LOS F?
F1 F 4051 4700 No
v 4051 4400 No
12
 $V = v - v$ 3296 4700 No
FO F R
v 755 2000 No
R

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 30.1$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.496$
Space mean speed in ramp influence area, $S = 53.6$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 53.6$ mph

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Phone:
E-mail:

Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis _____ Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1584 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 205 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane _____ ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 234 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1584	205	234 vph
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	440	57	65 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 1848 239 273 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 1848 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
v	2087	4700	No
FO			
v	2087	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 15.4 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

_____ Speed Estimation _____

Intermediate speed variable, M = 0.282
S
Space mean speed in ramp influence area, S = 58.5 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 58.5 mph

HCS+: Ramps and Ramp Junctions Release 5.2

Phone: Fax:
E-mail:

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis	Merge
Number of lanes in freeway	2
Free-flow speed on freeway	65.0 mph
Volume on freeway	2825 vph

On Ramp Data

Side of freeway	Right
Number of lanes in ramp	1
Free-flow speed on ramp	35.0 mph
Volume on ramp	219 vph
Length of first accel/decel lane	1000 ft
Length of second accel/decel lane	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 647 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2825	219	647
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	785	61	180
Trucks and buses	10 %	10 %	10 %
Recreational vehicles	0 %	0 %	0 %
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3296 256 755 poph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ = 1.000 \text{ Using Equation } 0$$

$$P = v \text{ (P)} = 3296 \text{ pc/h}$$

$$v = v \text{ (P)} = 3296 \text{ pc/h}$$

$$12 \text{ F FM}$$

Capacity Checks

	Actual	Maximum	LOS F?
v	3552	4700	No
FO	3552	4600	No
v			
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 26.8$ pc/mi/ln
R 12 A C

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.387

Space mean speed in ramp influence area, S = 56.1 mph

Space mean speed in outer lanes, S = N/A mph

Space mean speed for all vehicles, S = 56.1 mph

HCS+: Ramps and Ramp Junctions Release 5.2

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1789 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 184 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 471 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1789	184	471 vph
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	497	51	131 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2087 215 550 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 2087$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2087	4700	No
$F_i F$	2087	4400	No
V_{12}	1872	4700	No
$V_{FO} F R$	215	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 13.2$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.447$
Space mean speed in ramp influence area, $S = 54.7$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.7$ mph

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Phone: Fehr & Peers
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Fax: 2/7/2006
Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Freeway Data
Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3044 vph

Off Ramp Data
Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 635 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)
Does adjacent ramp exist? Yes
Volume on adjacent ramp 420 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions
Junction Components
Volume, V (vph) 3044
Peak-hour factor, PHF 0.90
Peak 15-min volume, v15 846
Trucks and buses 10
Recreational vehicles 0
Terrain type: Level
Grade 0.00 %
Length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3551 741 490 poph

Estimation of V12 Diverge Areas
L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
v = v + (v - v) P = 3551 pc/h
12 R F R FD

Capacity Checks
v = v Actual Maximum LOS F?
F1 F 3551 4700 No
v 3551 4400 No
12
v = v - v
FO F R 2810 4700 No
v R 741 2000 No

Level of Service Determination (if not F)
Density, D = 4.252 + 0.0086 v - 0.009 L = 25.8 pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence C
Speed Estimation

Intermediate speed variable, D = 0.495
Space mean speed in ramp influence area, S = 53.6 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 53.6 mph

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_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis _____ Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1605 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 471 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane _____ ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 184 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1605	471	184
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	446	131	51
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 1873 550 215 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 1873 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
v	2423	4700	No
v	2423	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 17.9 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

_____ Speed Estimation _____

Intermediate speed variable, M = 0.295
Space mean speed in ramp influence area, S = 58.2 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 58.2 mph

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_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis _____ Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2409 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 420 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane _____ ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 635 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2409	420	635 vph
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	669	117	176 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2811 490 741 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 2811 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	3301	4700	No
FO			
V	3301	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v_R + 0.0078 v₁₂ - 0.00627 L_A = 24.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C

_____ Speed Estimation _____

Intermediate speed variable, M = 0.357
Space mean speed in ramp influence area, S = 56.8 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 56.8 mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3109 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 209 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 678 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	3109	209	678
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	864	58	188
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3627 244 791
poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ 1.000 Using Equation 0
 $V = v + (v - v) P = 3627$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	3627	4700	No
$V_{12} F$	3627	4400	No
$V = v - v$	3383	4700	No
$V_{FO} F R$	244	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 26.4$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.450$
Space mean speed in ramp influence area, $S = 54.7$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.7$ mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2080 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 230 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 353 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2080	230	353
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	578	64	98
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:			
Grade	Level	Level	Level
Length	0.00 %	0.00 %	0.00 %
Trucks and buses PCE, ET	0.00 mi	0.00 mi	0.00 mi
Recreational vehicle PCE, ER	1.5	1.5	1.5
	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2427 268 412 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 2427$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2427	4700	No
$F_i F$	2427	4400	No
$v = v - v$	2159	4700	No
$FO F R$	268	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 16.1$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.452$
Space mean speed in ramp influence area, $S = 54.6$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.6$ mph

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Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2900 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 678 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 209 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components Freeway Ramp Adjacent Ramp
Volume, V (vph) 2900 678 209 vph
Peak-hour factor, PHF 0.90 0.90
Peak 15-min volume, v15 806 188 v
Trucks and buses 10 10 %
Recreational vehicles 0 0 %
Terrain type: Level Level Level
Grade % mi % mi % mi
Length 1.5 1.5 1.5
Trucks and buses PCE, ET 1.2 1.2 1.2
Recreational vehicle PCE, ER

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3383 791 244 poph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 3383 pc/h
12 F FM

Capacity Checks

v Actual Maximum LOS F?
FO 4174 4700 No
v 4174 4600 No
R12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 31.4 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.504
Space mean speed in ramp influence area, S = 53.4 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 53.4 mph

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Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1850 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 353 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 230 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components
Volume, V (vph) 1850 353 230 0.90 0.90 0.90 vph
Peak-hour factor, PHF 0.90 0.90 0.90 0.90 0.90 v
Peak 15-min volume, v15 514 98 64 10 10 %
Trucks and buses 10 10 10 0 0 %
Recreational vehicles 0 0 0 0 0 %
Terrain type: Level % Level % Level %
Grade % mi 1.5 1.5 1.5 mi
Length 1.5 1.2 1.2 1.5 1.2 mi
Trucks and buses PCE, ET 1.5 1.2 1.2 1.5 1.2
Recreational vehicle PCE, ER 1.2 1.2 1.2 1.5 1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00 1.00
Flow rate, vp 2158 2158 412 268 poph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 2158 pc/h
12 F FM

Capacity Checks

v Actual Maximum LOS F?
FO 2570 4700 No
v 2570 4600 No
R12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 19.1 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.302
Space mean speed in ramp influence area, S = 58.1 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 58.1 mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2966 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 368 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 511 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2966	368	511
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	824	102	142
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3460 429 596
poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ Using Equation 0
 $V = v + (v - v) P = 3460$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	3460	4700	No
$V_{12} F$	3460	4400	No
$V = v - v$	3031	4700	No
$V_{FO} F R$	429	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 25.0$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.467$
Space mean speed in ramp influence area, $S = 54.3$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.3$ mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2437 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 607 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 250 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2437	607	250
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	677	169	69
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2843 708 292
poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 2843$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2843	4700	No
$F_i F$	2843	4400	No
$v = v - v$	2135	4700	No
$FO F R$	708	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 19.7$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.492$
Space mean speed in ramp influence area, $S = 53.7$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 53.7$ mph

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_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis _____ Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2598 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 511 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane _____ ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 368 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2598	511	368
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	722	142	102
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3031 596 429 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 3031 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	3627	4700	No
FO			
V	3627	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 27.2 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence C

_____ Speed Estimation _____

Intermediate speed variable, M = 0.398
Space mean speed in ramp influence area, S = 55.9 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 55.9 mph

HCS+: Ramps and Ramp Junctions Release 5.2

Phone:
E-mail:

Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/7/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Project Conditions
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis _____ Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1830 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 250 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane _____ ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 607 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1830	250	607 vph
Peak-hour factor, PHF	0.90	0.90	0.90
Peak 15-min volume, v15	508	69	169 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2135 292 708 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 2135 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
v	2427	4700	No
v	2427	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 18.0 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

_____ Speed Estimation _____

Intermediate speed variable, M = 0.295
Space mean speed in ramp influence area, S = 58.2 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 58.2 mph

CUMULATIVE NO PROJECT CONDITIONS

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 1880 veh/h
Peak-hour factor, PHF 0.95
Peak 15-min volume, v15 495 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 1039 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 1039 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 58.0 mi/h
Number of lanes, N 2
Density, D 17.9 pc/mi/ln

Level of service, LOS

B

Overall results are not computed when free-flow speed is less than 55 mph.

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: _____
E-mail: _____
Fax: _____

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	3395	veh/h
Peak-hour factor, P _H F	0.95	
Peak 15-min volume, v ₁₅	893	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, E _T	1.5	
Recreational vehicle PCE, E _R	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	
Driver population factor, f _p	1.00	
Flow rate, v _p	1876	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban	Freeway

LOS and Performance Measures

Flow rate, vp	1876	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.5	mi/h
Number of lanes, N	2	
Density, D	32.6	pc/mi/ln

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Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Flow Inputs and Adjustments		
Volume, V	1965	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	517	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Grade	Level	%
Segment length	0.00	mi
Trucks and buses PCE, ET	0.00	
Recreational vehicle PCE, ER	1.5	
Heavy vehicle adjustment, fHV	1.2	
Driver population factor, fp	0.952	
Flow rate, vp	1.00	pc/h/ln
	1086	

Speed Inputs and Adjustments		
Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
Lane width adjustment, fLW	65.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	2.5	mi/h
Free-flow speed, FFS	4.5	mi/h
	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures		
Flow rate, vp	1086	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	18.7	pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Flow Inputs and Adjustments		
Volume, V	3170	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	834	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Grade	Level	%
Segment length	0.00	mi
Trucks and buses PCE, ET	0.00	
Recreational vehicle PCE, ER	1.5	
Heavy vehicle adjustment, fHV	1.2	
Driver population factor, fp	0.952	
Flow rate, vp	1.00	pc/h/ln
	1752	

Speed Inputs and Adjustments		
Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
Lane width adjustment, fLW	65.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	2.5	mi/h
Free-flow speed, FFS	4.5	mi/h
	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures		
Flow rate, vp	1752	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.9	mi/h
Number of lanes, N	2	
Density, D	30.2	pc/mi/ln

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

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Level of service, LOS

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

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Operational Analysis_____

Analyst:	Fehr & Peers
Agency or Company:	Fehr & Peers
Date Performed:	2/17/2006
Analysis time Period:	AM Peak Hour
Freeway/Direction:	SR 120 Eastbound
From/To:	Main to Union
Jurisdiction:	Manteca/San Joaquin
Analysis Year:	Cumulative No Project
Description:	Oleander/Sundance

Flow Inputs and Adjustments_____

Volume, V	1905	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	501	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1053	pc/h/in

Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, FLW	0.0	mi/h
Lateral clearance adjustment, FLC	0.0	mi/h
Interchange density adjustment, FID	2.5	mi/h
Number of lanes adjustment, FN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban	Freeway

LOS and Performance Measures

Flow rate, vp	1053	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	18.2	pc/mi/ln

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Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 2865 veh/h
Peak-hour factor, PHF 0.95
Peak 15-min volume, v15 754 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 1583 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 1583 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 58.0 mi/h
Number of lanes, N 2
Density, D 27.3 pc/mi/ln

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 5530 veh/h
Peak-hour factor, PHF 0.95
Peak 15-min volume, v15 1455 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 3056 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 3056 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 2
Number of lanes, N 2
Density, D pc/mi/ln

Level of service, LOS F
Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Flow Inputs and Adjustments	
Volume, V	2645 veh/h
Peak-hour factor, PHF	0.95
Peak 15-min volume, v15	696 v
Trucks and buses	10 %
Recreational vehicles	0 %
Terrain type:	Level
Grade	0.00 %
Segment length	0.00 mi
Trucks and buses PCE, ET	1.5
Recreational vehicle PCE, ER	1.2
Heavy vehicle adjustment, fHV	0.952
Driver population factor, fp	1.00
Flow rate, vp	1462 pc/h/ln

Speed Inputs and Adjustments	
Lane width	12.0 ft
Right-shoulder lateral clearance	6.0 ft
Interchange density	1.00 interchange/mi
Number of lanes, N	2
Free-flow speed:	Base
FFS or BFFS	65.0 mi/h
Lane width adjustment, fLW	0.0 mi/h
Lateral clearance adjustment, fLC	0.0 mi/h
Interchange density adjustment, fID	2.5 mi/h
Number of lanes adjustment, fN	4.5 mi/h
Free-flow speed, FFS	58.0 mi/h
Urban Freeway	

LOS and Performance Measures	
Flow rate, vp	1462 pc/h/ln
Free-flow speed, FFS	58.0 mi/h
Average passenger-car speed, S	58.0 mi/h
Number of lanes, N	2
Density, D	25.2 pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 5610 veh/h
Peak-hour factor, PHF 0.95
Peak 15-min volume, v15 1476 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 3100 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 3100 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 2
Number of lanes, N 2
Density, D pc/mi/ln

Level of service, LOS

F

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Flow Inputs and Adjustments	
Volume, V	2675 veh/h
Peak-hour factor, PHF	0.95
Peak 15-min volume, v15	704 v
Trucks and buses	10 %
Recreational vehicles	0 %
Terrain type:	Level
Grade	0.00 %
Segment length	0.00 mi
Trucks and buses PCE, ET	1.5
Recreational vehicle PCE, ER	1.2
Heavy vehicle adjustment, fHV	0.952
Driver population factor, fp	1.00
Flow rate, vp	1478 pc/h/ln

Speed Inputs and Adjustments	
Lane width	12.0 ft
Right-shoulder lateral clearance	6.0 ft
Interchange density	1.00 interchange/mi
Number of lanes, N	2
Free-flow speed:	Base
FFS or BFFS	65.0 mi/h
Lane width adjustment, fLW	0.0 mi/h
Lateral clearance adjustment, fLC	0.0 mi/h
Interchange density adjustment, fID	2.5 mi/h
Number of lanes adjustment, fN	4.5 mi/h
Free-flow speed, FFS	58.0 mi/h
Urban Freeway	

LOS and Performance Measures	
Flow rate, vp	1478 pc/h/ln
Free-flow speed, FFS	58.0 mi/h
Average passenger-car speed, S	58.0 mi/h
Number of lanes, N	2
Density, D	25.5 pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 2530 veh/h
Peak-hour factor, PHF 0.95
Peak 15-min volume, v15 666 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 1398 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 1398 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 58.0 mi/h
Number of lanes, N 2
Density, D 24.1 pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Ramps and Ramp Junctions Release 5.2

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1880 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 255 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 340 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1880	255	340
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	495	67	89
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2078 282 376 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ 1.000 Using Equation 0
 $V = v + (v - v) P = 2078$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2078	4700	No
$V_{12} F$	2078	4400	No
$V = v - v$	1796	4700	No
$V_{FO} F R$	282	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 13.1$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.453$
Space mean speed in ramp influence area, $S = 54.6$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.6$ mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3395 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 575 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 350 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	3395	575	350
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	893	151	92
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3752 636 387
poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 3752$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	3752	4700	No
$F_i F$	3752	4400	No
$v = v - v$	3116	4700	No
$FO F R$	636	2000	No
$v R$			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 27.5$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.485$
Space mean speed in ramp influence area, $S = 53.8$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 53.8$ mph

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_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis
Number of lanes in freeway Merge
Free-flow speed on freeway 65.0 mph
Volume on freeway 1625 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 340 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 255 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1625	340	255
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	428	89	67
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 1796 376 282 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 1796 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
v	2172	4700	No
v	2172	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 16.0 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

_____ Speed Estimation _____

Intermediate speed variable, M = 0.285
S
Space mean speed in ramp influence area, S = 58.4 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 58.4 mph

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_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis _____ Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2820 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 350 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane _____ ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 575 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2820	350	575
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	742	92	151
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3117 387 636 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 3117 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	3504	4700	No
FO			
V	3504	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v_R + 0.0078 v₁₂ - 0.00627 L_A = 26.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C

_____ Speed Estimation _____

Intermediate speed variable, M = 0.381
Space mean speed in ramp influence area, S = 56.2 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 56.2 mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1965 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 350 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 290 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1965	350	290
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	517	92	76
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2172 387 321 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ 1.000 Using Equation 0
 $V = v + (v - v) P = 2172$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2172	4700	No
V_{12}	2172	4400	No
$V = v - v$	1785	4700	No
V_{FO}	387	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 13.9$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.463$
Space mean speed in ramp influence area, $S = 54.4$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.4$ mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3170 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 650 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 345 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	3170	650	345
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	834	171	91
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3504 718 381
poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 3504$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	3504	4700	No
$F_i F$	3504	4400	No
$v = v - v$	2786	4700	No
$FO F R$	718	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 25.4$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.493$
Space mean speed in ramp influence area, $S = 53.7$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 53.7$ mph

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Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1615 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 290 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 350 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components
Volume, V (vph) 1615 290 350 vph
Peak-hour factor, PHF 0.95 0.95 0.95
Peak 15-min volume, v15 425 76 92 v
Trucks and buses 10 10 10 %
Recreational vehicles 0 0 0 %
Terrain type: Level Level Level
Grade % mi
Length 1.5 1.5 1.5 mi
Trucks and buses PCE, ET 1.2 1.2 1.2
Recreational vehicle PCE, ER

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 1785 321 387 poph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 1785 pc/h
12 F FM

Capacity Checks

v Actual Maximum LOS F?
FO 2106 4700 No
v 2106 4600 No
R12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 15.5 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.283
Space mean speed in ramp influence area, S = 58.5 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 58.5 mph

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_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis
Number of lanes in freeway Merge
Free-flow speed on freeway 65.0 mph
Volume on freeway 2520 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 345 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 650 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2520	345	650
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	663	91	171
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2785 381 718 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 2785 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
v	3166	4700	No
v	3166	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 23.7 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence C

_____ Speed Estimation _____

Intermediate speed variable, M = 0.343
Space mean speed in ramp influence area, S = 57.1 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 57.1 mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 5610 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 785 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 730 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	5610	785	730
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	1476	207	192
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 6201 868 807 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ 1.000 Using Equation 0
 $V = v + (v - v) P = 6201$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	6201	4700	Yes
$V_{12} F$	6201	4400	Yes
V_{12}	5333	4700	Yes
$V_{FO} F R$	868	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 48.6$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $D = 0.506$
Space mean speed in ramp influence area, $S = 53.4$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 53.4$ mph

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Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2675 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 440 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 295 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2675	440	295
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	704	116	78
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2957 486 326
poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 2957$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2957	4700	No
$F_i F$	2957	4400	No
$v = v - v$	2471	4700	No
$FO F R$	486	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 20.7$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.472$
Space mean speed in ramp influence area, $S = 54.1$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.1$ mph

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E-mail:

Fax:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 4825 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 730 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 785 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	4825	730	785
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	1270	192	207
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 5333 807 868 poph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 5333 pc/h
12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	6140	4700	Yes
FO			
v	6140	4600	Yes
R12			

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 46.7 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M = 2.061
Space mean speed in ramp influence area, S = 17.6 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 17.6 mph

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Phone:
E-mail:

Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis _____ Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2235 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 295 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane _____ ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 440 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2235	295	440
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	588	78	116
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2470 326 486
poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 2470 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	2796	4700	No
FO			
V	2796	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v_R + 0.0078 v₁₂ - 0.00627 L_A = 20.9 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C

_____ Speed Estimation _____

Intermediate speed variable, M = 0.315
Space mean speed in ramp influence area, S = 57.8 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 57.8 mph

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Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 5530 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 380 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 460 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	5530	380	460
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	1455	100	121
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 6112 420 508
poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 6112$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	6112	4700	Yes
$F_i F$	6112	4400	Yes
$v = v - v$	5692	4700	Yes
$FO F R$	420	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 47.8$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $D = 0.466$
Space mean speed in ramp influence area, $S = 54.3$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.3$ mph

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Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2645 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 395 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 425 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2645	395	425 vph
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	696	104	112 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2923 437 470 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 2923$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2923	4700	No
$F_i F$	2923	4400	No
$v = v - v$	2486	4700	No
$FO F R$	437	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 20.4$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.467$
Space mean speed in ramp influence area, $S = 54.3$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.3$ mph

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Phone:
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Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis
Number of lanes in freeway Merge
Free-flow speed on freeway 65.0 mph
Volume on freeway 5150 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 460 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 380 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	5150	460	380
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	1355	121	100
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 5692 508 420 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 5692 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
v	6200	4700	Yes
v	6200	4600	Yes
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 47.3 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence F

_____ Speed Estimation _____

Intermediate speed variable, M = 2.173
Space mean speed in ramp influence area, S = 15.0 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 15.0 mph

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Phone:
E-mail:

Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis _____ Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2250 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 425 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane _____ ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 395 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2250	425	395
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	592	112	104
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2487 470 437 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 2487 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	2957	4700	No
FO			
V	2957	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 22.1 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence C

_____ Speed Estimation _____

Intermediate speed variable, M = 0.326
S
Space mean speed in ramp influence area, S = 57.5 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 57.5 mph

CUMULATIVE WITH PROJECT CONDITIONS

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Level of service, LOS

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

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Operational Analysis

Analyst:	Fehr & Peers
Agency or Company:	Fehr & Peers
Date Performed:	2/17/2006
Analysis time Period:	AM Peak Hour
Freeway/Direction:	SR 120 Eastbound
From/To:	Airport to Y
Jurisdiction:	Manteca/San Joaquin
Analysis Year:	Cumulative Period
Description:	Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	2010	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	529	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1111	pc/h/

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban	Freeway

LOS and Performance Measures

Flow rate, vp	1111	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	19.2	pc/mi/ln

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Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 3742 veh/h
Peak-hour factor, PHF 0.95
Peak 15-min volume, v15 985 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 2068 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 2068 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 55.5 mi/h
Number of lanes, N 2
Density, D 37.2 pc/mi/ln

Level of service, LOS

E

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Flow Inputs and Adjustments		
Volume, V	2017	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	531	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Grade	Level	%
Segment length	0.00	mi
Trucks and buses PCE, ET	0.00	
Recreational vehicle PCE, ER	1.5	
Heavy vehicle adjustment, fHV	1.2	
Driver population factor, fp	0.952	
Flow rate, vp	1.00	pc/h/ln
	1115	

Speed Inputs and Adjustments		
Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
Lane width adjustment, fLW	65.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	2.5	mi/h
Free-flow speed, FFS	4.5	mi/h
	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures		
Flow rate, vp	1115	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	19.2	pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	3309	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	871	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level		%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1829	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1829	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.8	mi/h
Number of lanes, N	2	
Density, D	31.7	pc/mi/ln

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	2133	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	561	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Grade	Level	%
Segment length	0.00	mi
Trucks and buses PCE, ET	0.00	
Recreational vehicle PCE, ER	1.5	
Heavy vehicle adjustment, fHV	1.2	
Driver population factor, fp	0.952	
Flow rate, vp	1.00	pc/h/ln
	1179	

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
Lane width adjustment, fLW	65.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	2.5	mi/h
Free-flow speed, FFS	4.5	mi/h
	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1179	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	20.3	pc/mi/ln

Level of service, LOS

C

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	3041	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	800	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:		
Level	0.00	%
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1681	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	mi/h
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1681	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	29.0	pc/mi/ln

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 5627 veh/h
Peak-hour factor, PHF 0.95
Peak 15-min volume, v15 1481 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 3110 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 3110 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 2
Number of lanes, N 2
Density, D pc/mi/ln

Level of service, LOS F
Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Level of service, LOS

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

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Operational Analysis

Analyst:	Fehr & Peers
Agency or Company:	Fehr & Peers
Date Performed:	2/17/2006
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	SR 120 Westbound
From/To:	Main to Union
Jurisdiction:	Manteca/San Joaquin
Analysis Year:	Cumulative Plus Project
Description:	Oleander/Sundance

Flow Inputs and Adjustments_____

Volume, V	2905	veh/h
Peak-hour factor, P _H F	0.95	
Peak 15-min volume, v ₁₅	764	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, E _T	1.5	
Recreational vehicle PCE, E _R	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	
Driver population factor, f _p	1.00	
Flow rate, v _p	1605	pc/h/ln

Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:		
FFS or BFFS	Base	
Lane width adjustment, fLW	65.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	2.5	mi/h
Free-flow speed, FFS	4.5	mi/h
	58.0	mi/h
	Urban	Freeway

LOS and Performance Measures

Flow rate, vp	1605	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	27.7	pc/mi/ln

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 5732 veh/h
Peak-hour factor, PHF 0.95
Peak 15-min volume, v15 1508 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 3168 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 3168 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 2
Number of lanes, N 2
Density, D pc/mi/ln

Level of service, LOS

F

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 2769 veh/h
Peak-hour factor, PHF 0.95
Peak 15-min volume, v15 729 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 1530 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 1530 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 58.0 mi/h
Number of lanes, N 2
Density, D 26.4 pc/mi/ln

Level of service, LOS D
Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
E-mail:

Operational Analysis
Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/17/2006
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Flow Inputs and Adjustments
Volume, V 5859 veh/h
Peak-hour factor, PHF 0.95
Peak 15-min volume, v15 1542 v
Trucks and buses 10 %
Recreational vehicles 0 %
Terrain type: Level
Grade 0.00 %
Segment length 0.00 mi
Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2
Heavy vehicle adjustment, fHV 0.952
Driver population factor, fp 1.00
Flow rate, vp 3238 pc/h/ln

Speed Inputs and Adjustments
Lane width 12.0 ft
Right-shoulder lateral clearance 6.0 ft
Interchange density 1.00 interchange/mi
Number of lanes, N 2
Free-flow speed: Base
FFS or BFFS 65.0 mi/h
Lane width adjustment, fLW 0.0 mi/h
Lateral clearance adjustment, fLC 0.0 mi/h
Interchange density adjustment, fID 2.5 mi/h
Number of lanes adjustment, fN 4.5 mi/h
Free-flow speed, FFS 58.0 mi/h
Urban Freeway

LOS and Performance Measures
Flow rate, vp 3238 pc/h/ln
Free-flow speed, FFS 58.0 mi/h
Average passenger-car speed, S 2
Number of lanes, N 2
Density, D pc/mi/ln

Level of service, LOS F
Overall results are not computed when free-flow speed is less than 55 mph.

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Level of service, LOS

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst:	Fehr & Peers
Agency or Company:	Fehr & Peers
Date Performed:	2/17/2006
Analysis time Period:	PM Peak Hour
Freeway/Direction:	SR 120 Westbound
From/To:	Airport to Y
Jurisdiction:	Manteca/San Joaquin
Analysis Year:	Cumulative
Description:	Oleander/Sundance

Flow Inputs and Adjustments

Volume, V	2765	veh/h
Peak-hour factor, P _H F	0.95	
Peak 15-min volume, V ₁₅	728	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, E _T	1.5	
Recreational vehicle PCE, E _R	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	
Driver population factor, f _p	1.00	
Flow rate, v _p	1528	pc/h/

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, FLW	0.0	mi/h
Lateral clearance adjustment, FLC	0.0	mi/h
Interchange density adjustment, FID	2.5	mi/h
Number of lanes adjustment, FN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban	Freeway

LOS and Performance Measures

Flow rate, vp	1528	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	26.3	pc/mi/ln

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Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2010 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 333 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 340 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2010	333	340
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	529	88	89
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2222 368 376 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ 1.000 Using Equation 0
 $V = v + (v - v) P = 2222$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2222	4700	No
$V_{12} F$	2222	4400	No
$V = v - v$	1854	4700	No
$V_{FO} F R$	368	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 14.4$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.461$
Space mean speed in ramp influence area, $S = 54.4$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.4$ mph

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Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3742 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 783 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 350 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	3742	783	350
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	985	206	92
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 4136 865 387
poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = V + (V - V) P = 4136$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = V$	4136	4700	No
$F_i F$	4136	4400	No
V_{12}	3271	4700	No
$V = V - V$	865	2000	No
$FO F R$			
$V R$			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 V - 0.009 L = 30.8$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.506$
Space mean speed in ramp influence area, $S = 53.4$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 53.4$ mph

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Phone:
E-mail:

Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis
Number of lanes in freeway Merge
Free-flow speed on freeway 65.0 mph
Volume on freeway 1677 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 340 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 333 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1677	340	333 vph
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	441	89	88 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 1854 376 368 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 1854 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
v	2230	4700	No
FO			
v	2230	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 16.4 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

_____ Speed Estimation _____

Intermediate speed variable, M = 0.287
S
Space mean speed in ramp influence area, S = 58.4 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 58.4 mph

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Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2959 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 350 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 783 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2959	350	783 vph
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	779	92	206 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3270 387 865 poph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 3270 pc/h
12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
V	3657	4700	No
FO			
V	3657	4600	No
R12			

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 27.6 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.402
S
Space mean speed in ramp influence area, S = 55.8 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 55.8 mph

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Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2017 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 402 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 518 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2017	402	518
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	531	106	136
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2229 444 573 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 2229$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	2229	4700	No
$F_i F$	2229	4400	No
12	1785	4700	No
$V = v - v$	444	2000	No
$FO F R$			
$V R$			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 14.4$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.468$
S
Space mean speed in ramp influence area, $S = 54.2$ mph
R
Space mean speed in outer lanes, $S = N/A$ mph
0
Space mean speed for all vehicles, $S = 54.2$ mph

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Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3309 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 789 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 521 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	3309	789	521
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	871	208	137
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3657 872 576 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 3657$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	3657	4700	No
$F_i F$	3657	4400	No
12			
$v = v - v$	2785	4700	No
$FO F R$			
$v R$	872	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 26.7$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.506$
Space mean speed in ramp influence area, $S = 53.4$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 53.4$ mph

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Phone:
E-mail:

Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1615 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 518 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 402 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1615	518	402 vph
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	425	136	106 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 1785 573 444 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 1785 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
v	2358	4700	No
FO			
v	2358	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 17.3 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

_____ Speed Estimation _____

Intermediate speed variable, M = 0.292
S
Space mean speed in ramp influence area, S = 58.3 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 58.3 mph

HCS+: Ramps and Ramp Junctions Release 5.2

Phone:
E-mail:

Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2520 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 521 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 789 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2520	521	789
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	663	137	208
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2785 576 872 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 2785 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	3361	4700	No
FO			
V	3361	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v_R + 0.0078 v₁₂ - 0.00627 L_A = 25.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C

_____ Speed Estimation _____

Intermediate speed variable, M = 0.363
Space mean speed in ramp influence area, S = 56.6 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 56.6 mph

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Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 5732 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 785 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 912 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	5732	785	912
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	1508	207	240
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 6335 868 1008
poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 6335$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	6335	4700	Yes
$F_i F$	6335	4400	Yes
$v = v - v$	5467	4700	Yes
$FO F R$	868	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 49.7$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $D = 0.506$
Space mean speed in ramp influence area, $S = 53.4$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 53.4$ mph

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Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2769 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 440 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 436 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2769	440	436
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	729	116	115
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3060 486 482
poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ 1.000 Using Equation 0
 $V = v + (v - v) P = 3060$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	3060	4700	No
$V_{12} F$	3060	4400	No
V_{12}	2574	4700	No
$V_{FO} F R$	486	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 21.6$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.472$
Space mean speed in ramp influence area, $S = 54.1$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.1$ mph

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Phone:
E-mail:

Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2329 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 436 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 440 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2329	436	440
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	613	115	116
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2574 482 486 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 2574 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	3056	4700	No
FO			
V	3056	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 22.8 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence C

_____ Speed Estimation _____

Intermediate speed variable, M = 0.334
S
Space mean speed in ramp influence area, S = 57.3 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 57.3 mph

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Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 5627 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 477 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 582 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	5627	477	582
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	1481	126	153
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 6219 527 643 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P =$ 1.000 Using Equation 0
 FD
 $V = v + (v - v) P = 6219$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	6219	4700	Yes
$F_i F$	6219	4400	Yes
$v = v - v$	5692	4700	Yes
$FO F R$	527	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 48.7$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $D = 0.475$
Space mean speed in ramp influence area, $S = 54.1$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 54.1$ mph

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Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2905 vph

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 35.0 mph
Volume on ramp 655 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 519 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2905	655	519
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	764	172	137
Trucks and buses	10	10	10
Recreational vehicles	0	0	0
Terrain type:	Level	Level	Level
Grade	0.00 %	0.00 %	0.00 %
Length	0.00 mi	0.00 mi	0.00 mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3211 724 574 poph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 $P =$ Using Equation 0
 $V = v + (v - v) P = 3211$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$V = v$	3211	4700	No
V_{12}	3211	4400	No
$V = v - v$	2487	4700	No
V_{FO}	724	2000	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 22.9$ pc/mi/ln
R 12 D

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.493$
Space mean speed in ramp influence area, $S = 53.7$ mph
Space mean speed in outer lanes, $S = N/A$ mph
Space mean speed for all vehicles, $S = 53.7$ mph

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Phone:
E-mail:

Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Plus Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 5150 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 582 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 477 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	5150	582	477 vph
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	1355	153	126 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 5692 643 527 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 5692 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
v	6335	4700	Yes
v	6335	4600	Yes
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 48.3 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence F

_____ Speed Estimation _____

Intermediate speed variable, M = 2.450
Space mean speed in ramp influence area, S = 8.6 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S = 8.6 mph

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Phone:
E-mail:

Fax:

_____ Merge Analysis _____

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/17/2006
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative No Project
Description: Oleander/Sundance

_____ Freeway Data _____

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2250 vph

_____ On Ramp Data _____

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 519 vph
Length of first accel/decel lane 1000 ft
Length of second accel/decel lane ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 655 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2250	519	655 vph
Peak-hour factor, PHF	0.95	0.95	0.95
Peak 15-min volume, v15	592	137	172 v
Trucks and buses	10	10	10 %
Recreational vehicles	0	0	0 %
Terrain type:	Level	Level	Level
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5
Recreational vehicle PCE, ER	1.2	1.2	1.2

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2487 574 724 poph

_____ Estimation of V12 Merge Areas _____

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
V = v (P) = 2487 pc/h
12 F FM

_____ Capacity Checks _____

	Actual	Maximum	LOS F?
V	3061	4700	No
FO			
V	3061	4600	No
R12			

_____ Level of Service Determination (if not F) _____

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 22.8 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence C

_____ Speed Estimation _____

Intermediate speed variable, M = 0.334
S
Space mean speed in ramp influence area, S = 57.3 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 57.3 mph

**APPENDIX E:
APPROVED AND PENDING PROJECT LIST**

APPROVED AND PENDING PROJECTS

CITY OF MANTECA

1. Oakwood Shores	479 single-family units
2. Tara Park	583 single-family units
3. Assieh Industrial	1,738,200 square feet
4. Villa Ticino West	711 single-family units
5. Big League Dreams	45 acres
6. Stadium Plaza	500,000 square feet
7. Dutra Estates West	188 single-family units
8. Dutra Farms S.W.	194 (97 built) single-family units
9. Dutra Estates	426 single-family units
10. Bella Vista	262 (131 built) single-family units
11. Terra Ranch	269 single-family units
12. Machado Estates	564 single-family units
13. Union Ranch	1,960 single-family units
14. Commercial Multi Use	400,000 square feet
15. Yosemite Park	253 single-family units
16. Hensley Office Building	30,800 square feet
17. Westport Plaza	24 single-family units
18. General Commercial	160,000 square feet
19. Lifestyle Retail	854,000 square feet
20. Lifestyle Hotel	300 rooms
21. Union Commercial	510,000 square feet
22. Retail Store	2,400 square feet
23. Antigua	120 single-family units
24. Veritas School	512 students
25. Terra Bella	158 single-family units
26. Ken Hill Estates	12 single-family units
27. Milner Estates	215 single-family units
28. Shadowbrook	497 single-family units
29. Cardoza Estates	50 single-family units
30. Rodoni Estates	99 single-family units
31. Lincoln Estates	19 single-family units
32. Cardoza Hogan	19 single-family units
33. Paseo West	191 single-family units
34. Paseo Apartments	293 multi-family units
35. Morse Estates	23 single-family units
36. Evans Estates	586 single-family units
37. Pillsbury Estates	275 single-family units
38. Crivello Estates	62 single-family units
39. Tesoro	485 single-family units
40. Lundbom Estates	21 single-family units