Appendix H Traffic Impact Analysis

THE VILLAGE AT BELLA TERRA

Traffic Study

July 2008

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DRAFT

City of Huntington Beach

THE VILLAGE AT BELLA TERRA TRAFFIC STUDY

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EXECUTIVE SUMMARY

This report summarizes the results of a traffic study for The Village at Bella Terra project in the City of Huntington Beach. The study provides the technical information for the Circulation section of the Environmental Impact Report (EIR) being prepared for this project.

PROJECT DESCRIPTION

The proposed project is located between Center Avenue and Edinger Avenue immediately west of the existing Bella Terra shopping center. The site is currently vacant with some unoccupied buildings and unused paved area. Access will be from both Center Avenue and Edinger Avenue.

A General Plan Amendment (GPA) is being processed for the project, with two alternative levels of development analyzed here. The first is buildout under a proposed GPA with two potential development options as listed below. The second is an Alternative GPA with reduced development. The following are the land uses for each alternative/option:

Proposed GPA Option 1:	713 residential units 138,085 square feet of commercial uses
Proposed GPA Option 2:	538 residential units 165 room hotel 181,118 square feet of commercial uses
Alternative GPA: **(Reduced Project)**	538 residential units 138,085 square feet of commercial uses

By way of comparison, the current General Plan would allow 396 residential units and 345,213 square feet of commercial uses.

ANALYSIS SCOPE

The traffic study provides both a short-range and long-range impact analysis of the proposed and Alternative GPA. The short-range analysis addresses conditions shortly after project completion and identifies impacts related to additional traffic on the surrounding area street system in this timeframe.

The project trips are added to year 2014 no-project background traffic to show the impacts of the proposed project. The long-range (2030) analysis evaluates the projects in a General Plan context by comparing future traffic under the current General Plan land uses with traffic conditions for the proposed GPA and for the Alternative GPA (i.e., a "plan to plan" analysis).

The short-range and long-range traffic forecasts are produced using the Huntington Beach Traffic Model (HBTM). Performance criteria appropriate for the jurisdictions involved (City of Westminster and Caltrans in addition to the City of Huntington Beach) are applied to the traffic volume data. These performance criteria use peak hour volumes to measure level of service (LOS) and to define levels of significance for EIR purposes.

PROJECT TRIP GENERATION

To establish trip generation estimates for the project, applicable trip rates were derived for the proposed uses in the context of a mixed-use project adjacent to an existing regional retail center. The resulting trip generation reflects trip generation features such as local trip capture. The following summarizes the project trip generation for the existing plus project uses (i.e., Bella Terra Phase 1 as built, plus The Village at Bella Terra):

BELLA TERRA TRIP GENERATION – PROPOSED PROJECT VERSUS GENERAL PLAN

	AM Peak Hour			**PM Peak Hour**			
Description	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**ADT**
EXISTING PLUS CURRENT GENERAL PLAN	402	381	783	1,419	1,414	2,833	27,919
GPA OPTION 1							
EXISTING PLUS GPA OPTION 1	385	471	856	1,363	1,288	2,651	26,020
DIFFERENCE	-17	90	73	-56	-126	-182	-1,899
GPA OPTION 2							
EXISTING PLUS GPA OPTION 2	437	449	886	1,393	1,346	2,739	27,285
DIFFERENCE	35	68	103	-26	-68	-89	-634
ALTERNATIVE GPA							
EXISTING PLUS ALTERNATIVE GPA	372	408	780	1,309	1,264	2,573	25,220
DIFFERENCE	-30	27	-3	-110	-150	-260	-2,699

The proposed GPA Option 2 has higher trip generation than Option 1 (except for slightly lower outbound trips in the AM peak hour) and has therefore been used as the basis for the proposed GPA analysis. A full analysis was also carried out for the Alternative GPA, which has reduced land uses as noted earlier and lower trip generation as can be seen above.

SUMMARY OF FINDINGS

The following are the major findings of the traffic impact analysis.

1. Existing conditions in the study area are such that all intersections are operating at acceptable levels of service with the exception of Beach Boulevard at Edinger Avenue.

2. The I-405 northbound loop on-ramp from Beach Boulevard is currently deficient during the AM and PM peak hours.

3. There is a significant project traffic contribution to a short-range (2014) deficiency at the Beach Boulevard/Edinger Avenue intersection (i.e., there is a deficiency at this location with and without the project, but the project traffic contribution exceeds the significance threshold).

4. The project contributes to a short-range deficiency at the I-405 northbound loop on-ramp from Beach Boulevard. This ramp is deficient with and without the project, but the project contribution exceeds the significance threshold.

5. While the long-range (2030) results show seven intersections in the study area to be deficient, the analysis shows that compared to the General Plan, the proposed GPA and the Alternative GPA do not cause any significant impacts (i.e., the levels of service are either the same or slightly better).

6. At the seven deficient intersections in 2030, the project has a significant traffic contribution to only one; Beach Boulevard at Edinger Avenue.

7. The proposed mitigation for the Beach Boulevard/Edinger Avenue intersection is to participate in future improvements on a fair share basis. The recommended improvements are as follows:

    a. Add third westbound through lane
    b. Add fourth northbound through lane

Either improvement would mitigate the project impacts and both are needed to mitigate long-range cumulative deficiencies.

8. Project shares for the Beach Boulevard/Edinger Avenue intersection improvements are as follows:

	Proposed GPA	**Alternative GPA**
1. Third WB Through Lane	38%	33%
2. Fourth NB Through Lane	38%	33%

One of these improvements needs to be implemented by project occupancy. For the combined mitigation measures, the project shares are 13 percent and eight percent for the Proposed GPA and Alternative GPA, respectively.

9. For the I-405 northbound loop on-ramp from Beach Boulevard, improvements presented in the recent Project Study Report/Project Development Assistance (PSR/PDA prepared by OCTA) include widening the ramp to two lanes. This would provide adequate capacity for future volumes at this location.

10. The project adds traffic to locations on the State Highway System that have year 2030 deficiencies. There are no defined significance criteria for these, and hence they are considered to be potential significant and unavoidable impacts. Proposed improvements are included in the PSR/PDA cited above.

Chapter 1.0
INTRODUCTION

This report summarizes the results of a traffic study for The Village at Bella Terra Project in the City of Huntington Beach. The study provides the technical information for the Circulation section of the Environmental Impact Report (EIR) being prepared for this project.

BACKGROUND AND SCOPE

The proposed project is located between Center Avenue and Edinger Avenue immediately west of the existing Bella Terra shopping center. The site is currently vacant with some unoccupied buildings and unused paved area. Access will be from both Center Avenue and Edinger Avenue.

Two potential development plans are analyzed here. The first is buildout under a proposed General Plan Amendment (GPA), which would add 538 residential dwelling units, a 165 room hotel, and 181,118 square feet of commercial uses. The second is an Alternative GPA proposed development plan which would add 538 residential dwelling units and 138,085 square feet of commercial uses. Labeled the "Alternative GPA (reduced project)," it is referred to throughout this report as the "Alternative GPA."

The traffic study provides both a short-range and long-range impact analyses of the two projects. The short-range analysis addresses conditions shortly after project completion and identifies project impacts related to additional traffic on the surrounding area street system in this timeframe. The long-range analyzes the projects in a General Plan context.

Traffic analysis data sets presented in this traffic study are thereby as follows for each of the two potential development plans:

1. Short-range no-project
2. Short-range with-project
3. Long-range with current General Plan land uses
4. Long-range with proposed GPA land uses

For the short-range impact analysis, the additional trips that will be generated by the proposed uses are added to the no-project background traffic conditions to show the impacts of the proposed project. The background (no-project) conditions are established by interpolating between existing and long-range traffic volumes. This accounts for ambient growth, including development anticipated to occur in the surrounding area in this short-range time frame. The short-range analysis time frame is referred to as 2014 which is after anticipated project occupancy. It thereby fully accounts for project buildout and also addresses Growth Management Plan (GMP) and Congestion Management Program (CMP) needs for a short-range (five to seven years) time frame.

The long-range analysis compares the current General Plan land uses with those proposed by the GPA and by the Alternative GPA (i.e., a "plan to plan" analysis). A year 2030 time frame is used for this analysis.

Year 2030 forecasts are produced using the Huntington Beach Traffic Model (HBTM). This is a subarea model derived from the Orange County Transportation Analysis Model (OCTAM), following the consistency guidelines established by the Orange County Transportation Authority (OCTA).

Performance criteria appropriate for the jurisdictions involved (City of Westminster and Caltrans in addition to the City of Huntington Beach) are applied to the traffic volume data. These performance criteria use peak hour intersection volumes to measure level of service (LOS) and to define levels of significance for EIR purposes (see later section of this chapter).

To establish the trip generation estimates for the project, a special analysis has been carried out to identify applicable trip rates for the residential, hotel and commercial uses in the context of a mixed-use project adjacent to an existing regional retail center. The resulting trip generation reflects trip generation features such as local trip capture.

Consistent with the requirements of an EIR, only committed roadway improvements have been assumed, even for the long-range analysis using General Plan buildout land uses. A discussion of the assumptions in the committed network is provided in Chapter 2.0.

PERFORMANCE CRITERIA

The performance criteria used for evaluating traffic volumes and capacities on the study area street system are based on peak hour volumes. Using peak hour intersection turn movement volumes and the intersection lane geometry, intersection capacity utilization (ICU) values are calculated for each of the AM and PM peak hours. The ICU values represent volume/capacity (V/C) ratios for these time periods, and thereby provide a suitable measure of system performance. For Caltrans intersections, the delay-based methodology, as contained in the Highway Capacity Manual (HCM), is also used (i.e., both ICU values and average delay are calculated for these intersections).

Table 1-1 summarizes the criteria used for the intersection LOS calculations and the relationship between ICU, average vehicle delay, and LOS. The significance criteria for intersections based on ICU contribution is also listed in the table. This is used for both City and Caltrans intersections (the delay calculations are used only to verify the LOS results as calculated from the ICU values).

Table 1-2 describes traffic flow quality for different V/C and vehicle delay ranges. Traffic levels of service are designated "A" through "F", with LOS "A" representing free flow conditions and LOS "F" representing severe traffic congestion. As listed in the previously referenced performance criteria table, LOS "D" (ICU not to exceed .90) is the performance standard that has been adopted by the Cities of Huntington Beach and Westminster, whereas LOS "E" (ICU not to exceed 1.00) is the performance standard for Orange County Congestion Management Program (CMP) intersections. Two CMP intersections are located in the study area:

Beach Boulevard at Edinger Avenue
Beach Boulevard at Warner Avenue

Although LOS "E" is acceptable for CMP purposes at these locations, the City performance standard of LOS "D" is typically used in traffic analysis applications.

Freeway interchange ramps are also included in the analysis and Table 1-3 summarizes the criteria used for freeway ramps. The analysis is based on peak hour V/C ratios, with capacity being a function of the particular operating characteristics of each ramp.

Table 1-1

CIRCULATION SYSTEM PERFORMANCE CRITERIA

The following are the performance criteria used for comparing volumes and capacities on the study area street system:

I. PEAK HOUR INTERSECTION VOLUMES

Intersection capacity utilization (ICU) values calculated as follows:

Saturation Flow Rate: 1,700 vehicles per hour (VPH).

Clearance Interval: .05 ICU

Performance Standard

- Arterial intersections to achieve level of service (LOS) D or better (ICU not to exceed .90)
- Orange County Congestion Management Program (CMP) designated intersections to achieve LOS E or better (ICU not to exceed 1.00)

LOS ranges for ICU values are as follows:

ICU	LOS
0.00 – 0.60	A
0.61 – 0.70	B
0.71 – 0.80	C
0.81 – 0.90	D
0.91 – 1.00	E
Above 1.00	F

Significance Criteria

Project causes a significant impact if it contributes .01 or more to an ICU when the performance standard is exceeded.

II. CALTRANS INTERSECTIONS AND UNSIGNALIZED ACCESS INTERSECTIONS

Intersection LOS based on average vehicle delay in seconds as calculated using Highway Capacity Manual (HCM) procedures. Performance standard as above, and LOS values for average vehicle delay are as follows:

Level of Service	Signalized	Unsignalized
A	0 – 10.00	0 – 10.00
B	10.01 – 20.00	10.01 – 15.00
C	20.01 – 35.00	15.01 – 25.00
D	35.01 – 55.00	25.01 – 35.00
E	55.01 – 80.00	35.01 – 50.00
F	80.01 and up	50.01 and up

Table 1-2

LEVEL OF SERVICE DESCRIPTIONS – SIGNALIZED INTERSECTIONS

Levels of service (LOS) for signalized intersections are defined in terms of control delay as follows:

LOS	Description	Delay Per Vehicle (secs)
A	LOS A describes operations with low control delay, up to 10 seconds per vehicle. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.	< 10
B	LOS B describes operations with control delay greater than 10 and up to 20 seconds per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than the LOS A, causing higher levels of delay.	10 – 20
C	LOS C describes operations with control delay greater than 20 and up to 35 seconds per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.	20 – 35
D	LOS D describes operations with control delay greater than 35 and up to 55 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35 – 55
E	LOS E describes operations with control delay greater than 55 and up to 80 seconds per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent.	55 – 80
F	LOS F describes operations with control delay in excess of 80 seconds per vehicle. This level, considered unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high V/C ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.	> 80

Source: Highway Capacity Manual 2000, Transportation Research Board, National Research Council

Table 1-3

FREEWAY RAMP PERFORMANCE CRITERIA

V/C Calculation Methodology

Level of service to be based on peak hour volume/capacity (V/C) ratios calculated using the following ramp capacities:

Metered On-Ramps

A maximum capacity of 900 vehicles per hour (vph) for a one-lane metered on-ramp with only one mixed-flow lane at the meter.

A maximum capacity of 1,080 (20 percent greater than 900) vph for a one-lane metered on-ramp with one mixed-flow lane at the meter plus one HOV preferential lane at the meter.

A maximum capacity of 1,500 vph for a one-lane metered on-ramp with two mixed-flow lanes at the meter.

A maximum capacity of 1,800 vph for a two-lane metered on-ramp with two mixed-flow lanes at the meter.

Non-Metered On-Ramps and Off-Ramps

A maximum capacity of 1,500 vph for a one-lane ramp (convergence/Divergence point)*.

A maximum capacity of 2,250 (50 percent greater than 1,500) vph for a two-lane on-ramp that tapers to one merge lane at or beyond the freeway mainline gore point and for a two-lane off-ramp with only one auxiliary lane.

A maximum capacity of 3,000 vph for a two-lane on-ramp that does not taper to one merge lane and for a two-lane off-ramp with two auxiliary lanes.

Performance Standard

Level of Service "E" (peak hour V/C less than or equal to 1.00).

Significance Criteria

Project causes a significant impact if it contributes .01 or more to a ramp V/C ratio when the performance standard is exceeded.

* Assumes that the lane widens out to provide adequate capacity at the intersection (otherwise, capacity reduces to 1,200 vph).

STUDY AREA

A study area has been defined according to the potential impacts of the projects being analyzed. For peak hour intersection analyses, the one percent significance threshold generally translates to around 20 peak hour vehicles or more entering an intersection (since most intersections in the area have more than 2,000 vehicles per hour entering the intersection). Hence, this criterion has been used in selecting intersections for the impact analysis. It should also be noted that a special analysis was made of the project intersections and the immediately adjacent intersections on Edinger Avenue east of the project.

Chapter 2.0
TRANSPORTATION SETTING

This chapter describes the transportation setting for the proposed project. Existing conditions for the study area circulation system are first summarized, followed by the future background setting against which project impacts are evaluated.

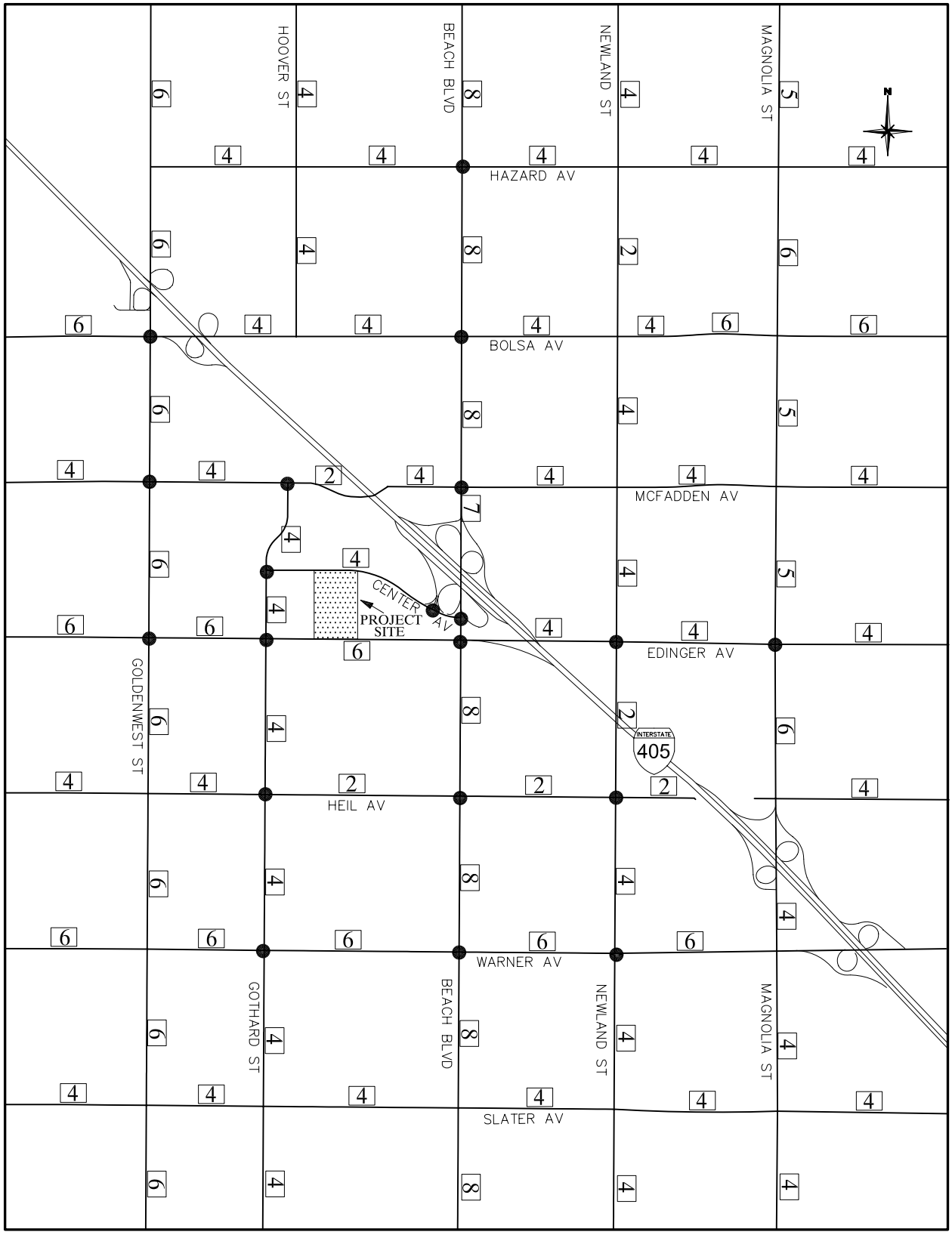
EXISTING CONDITIONS

The study area circulation system is shown in Figure 2-1 along with existing midblock lanes and intersection controls. The existing (2006) average daily traffic (ADT) volumes in the study area are presented in Figure 2-2. Arterial roadways in the vicinity of the project include Gothard Street with 15,000 ADT, Center Avenue with 10,000 ADT, and Edinger Avenue with 30,000 ADT.

As described in the performance criteria section in Chapter 1.0, the intersection levels of service (LOS) are measured by peak hour intersection capacity utilization (ICU) values. For Caltrans intersections (along Beach Boulevard) average vehicle delay calculations are also made using the Highway Capacity Manual (HCM) methodology.

Existing peak hour intersection volumes are illustrated in Figures 2-3 and 2-4 for the AM and PM peak hours, respectively. The corresponding levels of service are summarized in Table 2-1 (an intersection location diagram is provided in Figure 2-5.) The calculations for the ICU values in this table can be found in Appendix A and the HCM calculations are in Appendix B.

The existing conditions summary shows all intersections to be operating at LOS “D” or better with the exception of Beach Boulevard at Edinger Avenue during the AM and PM peak hours. While the theoretical ICU indicates LOS “D”, the operational LOS is “E” as indicated by the HCM results. This is due to eastbound and northbound lane utilization being less than optimum. The eastbound traffic is concentrated in the right lane in preparation for accessing the I-405 southbound freeway ramp. The northbound traffic merges from four lanes to three through lanes just prior to the intersection (the fourth lane becomes a right turn lane). This merge plus local driveway traffic weaving against traffic in the right turn lane causes flow rates to deteriorate such that queuing occurs at peak times.



Legend

X Midblock Lanes

● Signalized Intersection analyzed in the traffic study

Figure 2-1

EXISTING CIRCULATION SYSTEM

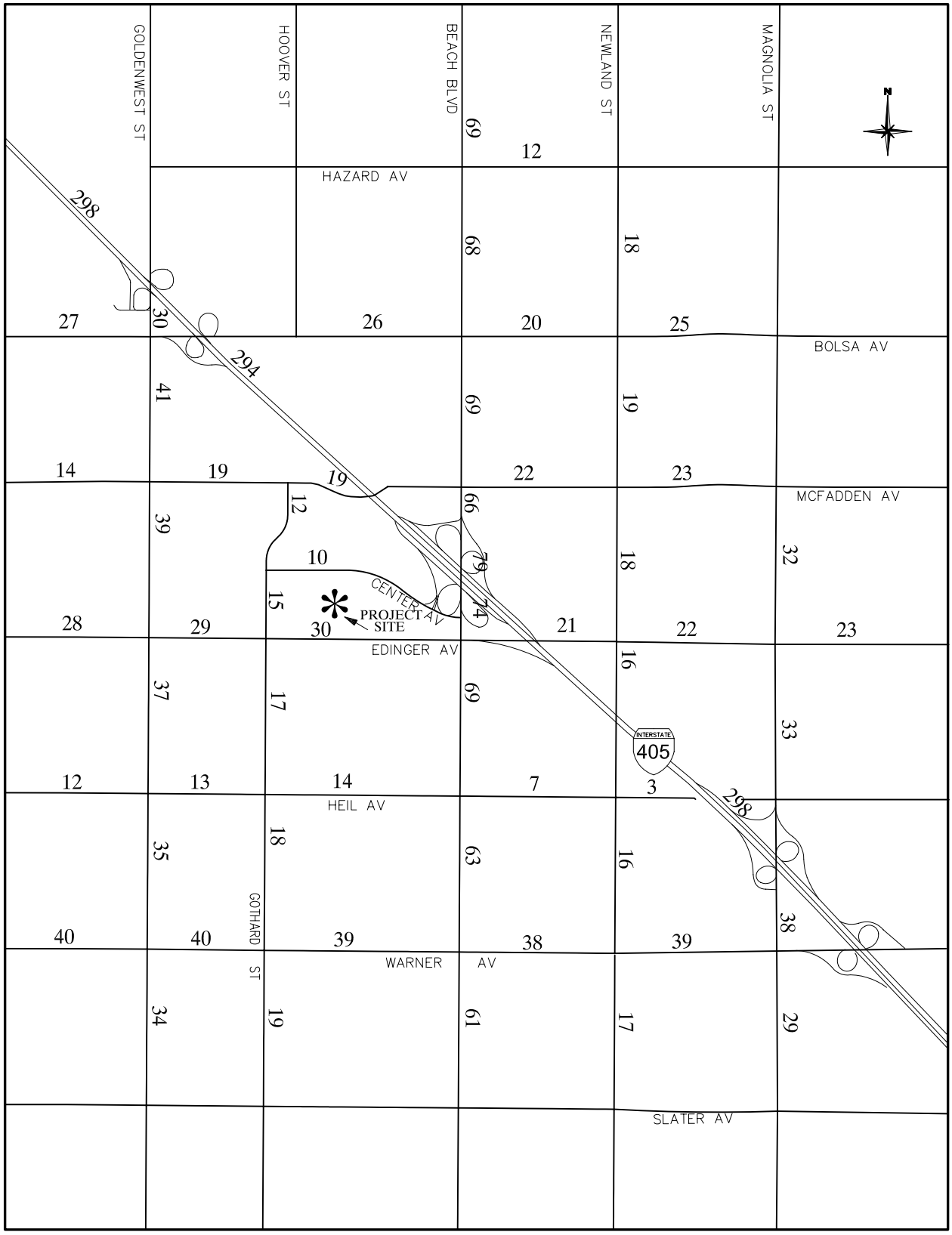


Figure 2-2

STUDY AREA ADT VOLUMES (000s)
- EXISTING (YEAR 2006)

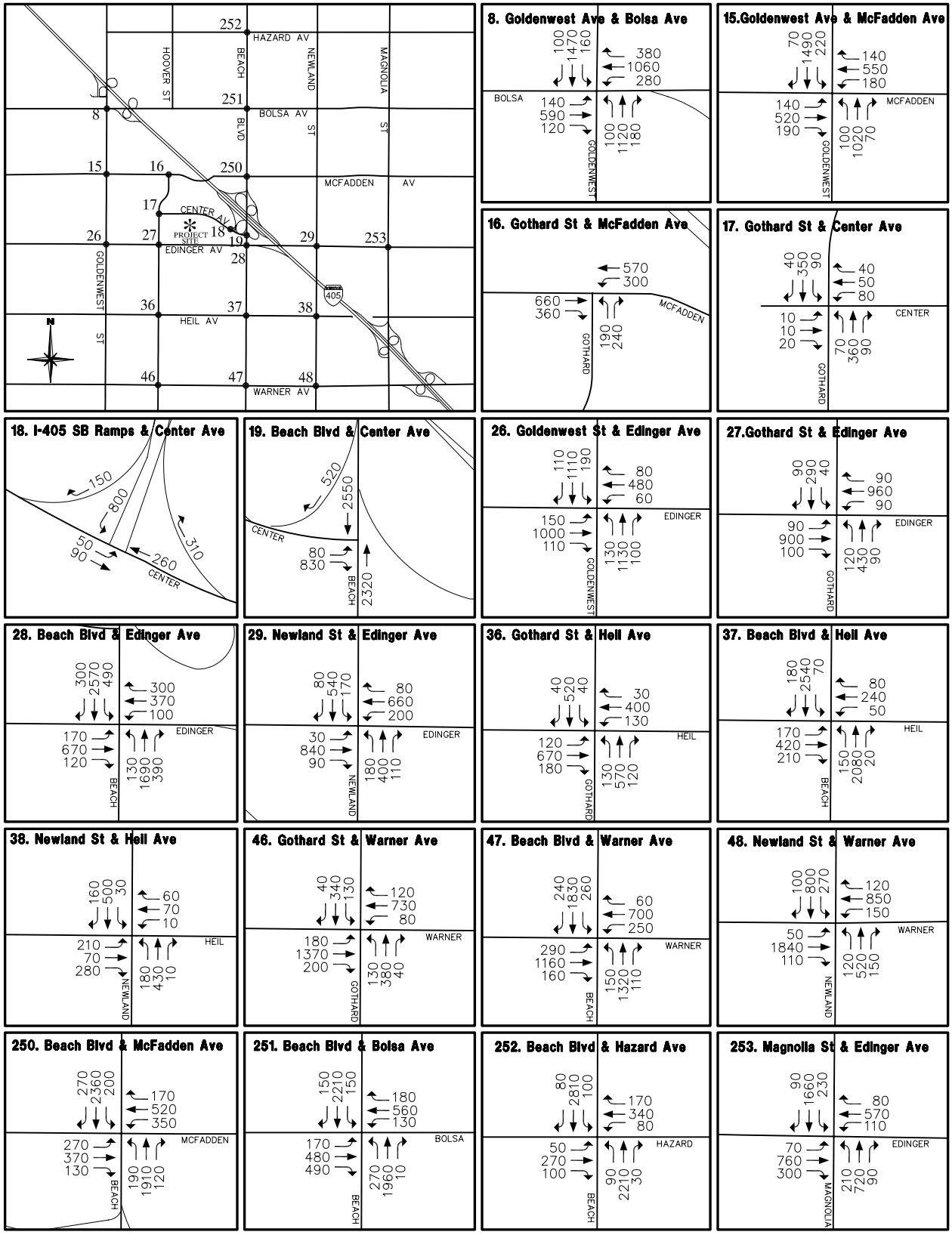


Figure 2-3

EXISTING AM PEAK HOUR VOLUMES

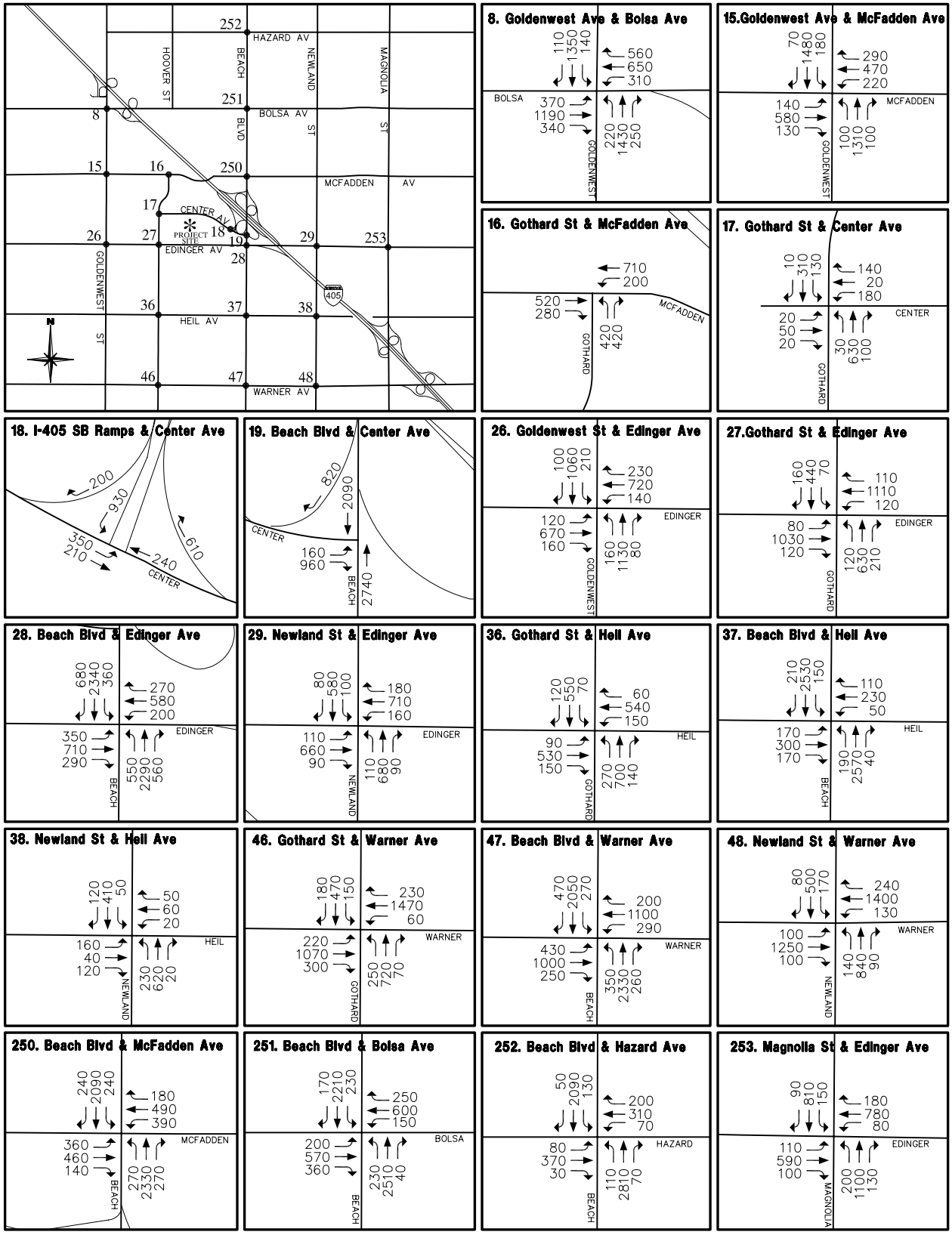


Figure 2-4

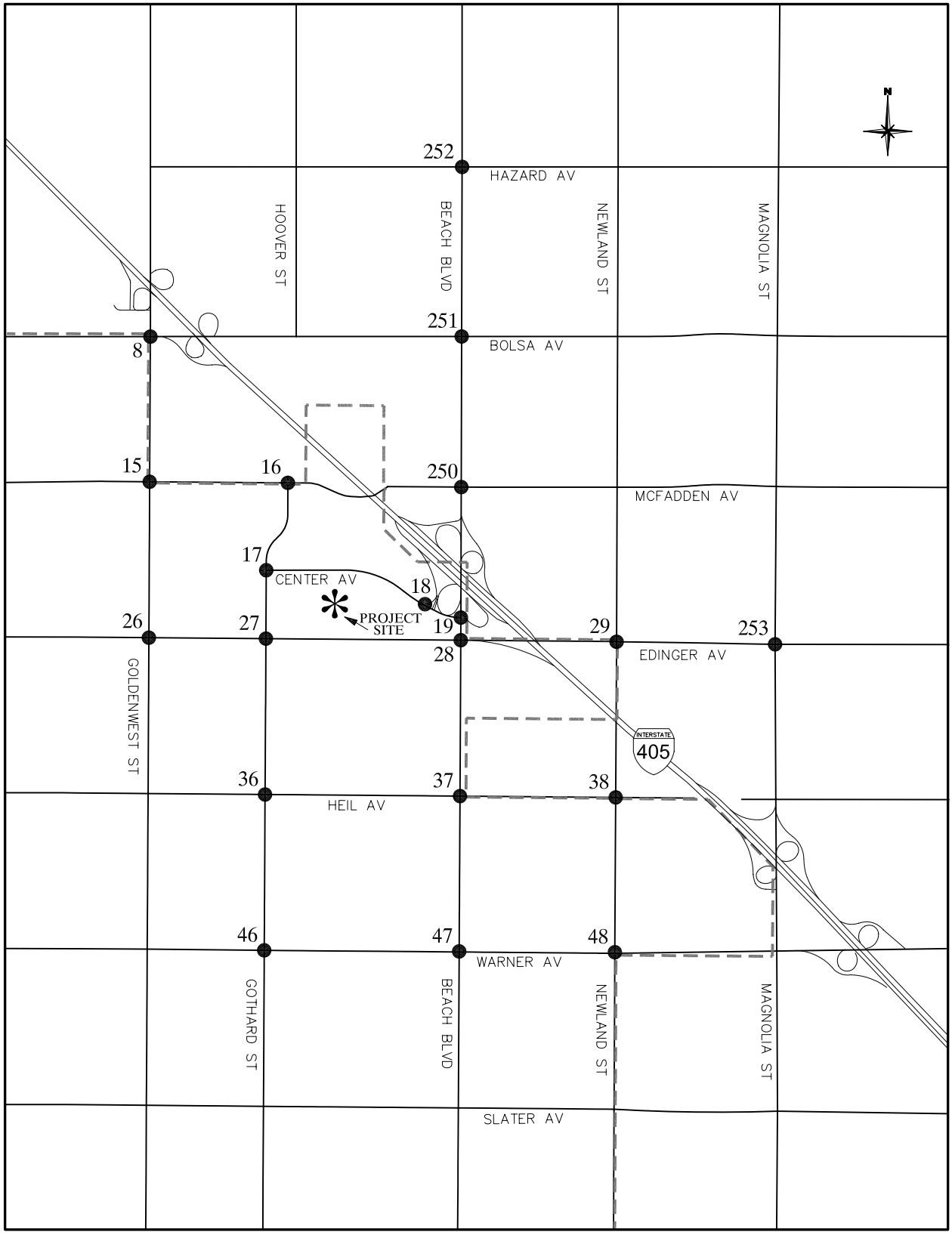
EXISTING PM PEAK HOUR VOLUMES

Table 2-1

EXISTING INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection Capacity Utilization (ICU)				
	AM Peak Hour		**PM Peak Hour**	
Location*	**ICU**	**LOS**	**ICU**	**LOS**
8. Goldenwest St & Bolsa Ave	.64	B	.86	D
15. Goldenwest St & McFadden Ave	.68	B	.72	C
16. Gothard St & McFadden Ave	.48	A	.51	A
17. Gothard St & Center Ave	.28	A	.47	A
18. I-405 SB Ramps & Center Ave	.40	A	.75	C
19. Beach Blvd & Center Ave.	.67	B	.68	B
26. Goldenwest St & Edinger Ave	.62	B	.60	A
27. Gothard St & Edinger Ave	.47	A	.57	A
28. Beach Blvd & Edinger Ave	.71	C	.88	D
29. Newland St & Edinger Ave	.71	C	.62	B
36. Gothard St & Heil Ave	.56	A	.62	B
37. Beach Blvd & Heil Ave	.78	C	.80	C
38. Newland St & Heil Ave	.51	A	.46	A
46. Gothard St & Warner Ave	.56	A	.77	C
47. Beach Blvd & Warner Ave	.69	B	.89	D
48. Newland St & Warner Ave	.81	D	.87	D
250. Beach Blvd & McFadden Ave	.78	C	.81	D
251. Beach Blvd & Bolsa Ave	.81	D	.79	C
252. Beach Blvd & Hazard Ave	.64	B	.70	B
253. Magnolia St & Edinger Ave	.78	C	.67	B
Highway Capacity Manual (HCM) Delay (Caltrans Intersections)				
	AM Peak Hour		**PM Peak Hour**	
Location*	**Delay**	**LOS**	**Delay**	**LOS**
18. I-405 SB Ramps & Center Ave	30.9	C	35.0	C
19. Beach Blvd & Center Ave	9.7	A	18.5	B
28. Beach Blvd & Edinger Ave	58.0	E	57.7	E
37. Beach Blvd & Heil Ave	22.3	C	15.9	B
47. Beach Blvd & Warner Ave	50.0	D	42.1	D
250. Beach Blvd & McFadden Ave	33.6	C	31.5	C
251. Beach Blvd & Bolsa Ave	38.7	D	32.3	C
252. Beach Blvd & Hazard Ave	22.7	C	26.9	C

* See intersection locations in Figure 2-5



Legend

City Limits

Figure 2-5

INTERSECTION LOCATION MAP

Existing conditions on the freeway ramps that would be affected by the proposed project are summarized in Table 2-2. The I-405 northbound loop ramp from Beach Boulevard exceeds the V/C threshold of 1.0 in both the AM and PM peak hours.

FUTURE CONDITIONS

The study area circulation system as defined by the Orange County Master Plan of Arterial Highways (MPAH) can be seen in Figure 2-6. Study area roadway segments not currently built to their full MPAH standard are as follows:

Roadway	Segment	MPAH	Existing
McFadden Ave	Goldenwest St to Beach Blvd	4-lane secondary arterial	2-lane roadway over I-405
Gothard St	Hoover St to McFadden Ave	4-lane secondary arterial	Not built
Heil Ave	Gothard St to Newland Ave	4-lane secondary arterial	2-lane roadway

Neither of the first two have current funding commitments for constructing to MPAH standards (widening in the case of McFadden Avenue and construction in the case of Gothard Street). Widening of the McFadden Avenue overcrossing of I-405 is included in the current improvement project for the I-405 Corridor (see discussion in Chapter 5.0). Since this is still in the review stage with construction not fully funded at this time, the bridge improvement was not included as a committed project.

Widening of Heil Avenue from Gothard Street to Beach Boulevard is part of the committed roadway system discussed below (widening of the section from Beach Boulevard to Newland Avenue is not yet committed).

For traffic analysis purposes, only currently committed roadway improvements have been assumed in the impact analysis. For the study area, these are as follows:

Location	Improvement	Time Frame
I-405 Freeway*	Add one lane in each direction from I-605 to SR-73	Long-Range
Heil Ave	Widen to four lanes from Gothard St to Beach Blvd	Short-Range
Beach Blvd/Heil Ave	Convert westbound right turn lane to westbound through lane	Short-Range
Beach Blvd/Edinger Ave	Add second westbound left turn lane	Short-Range
* See discussion in Chapter 5.0		

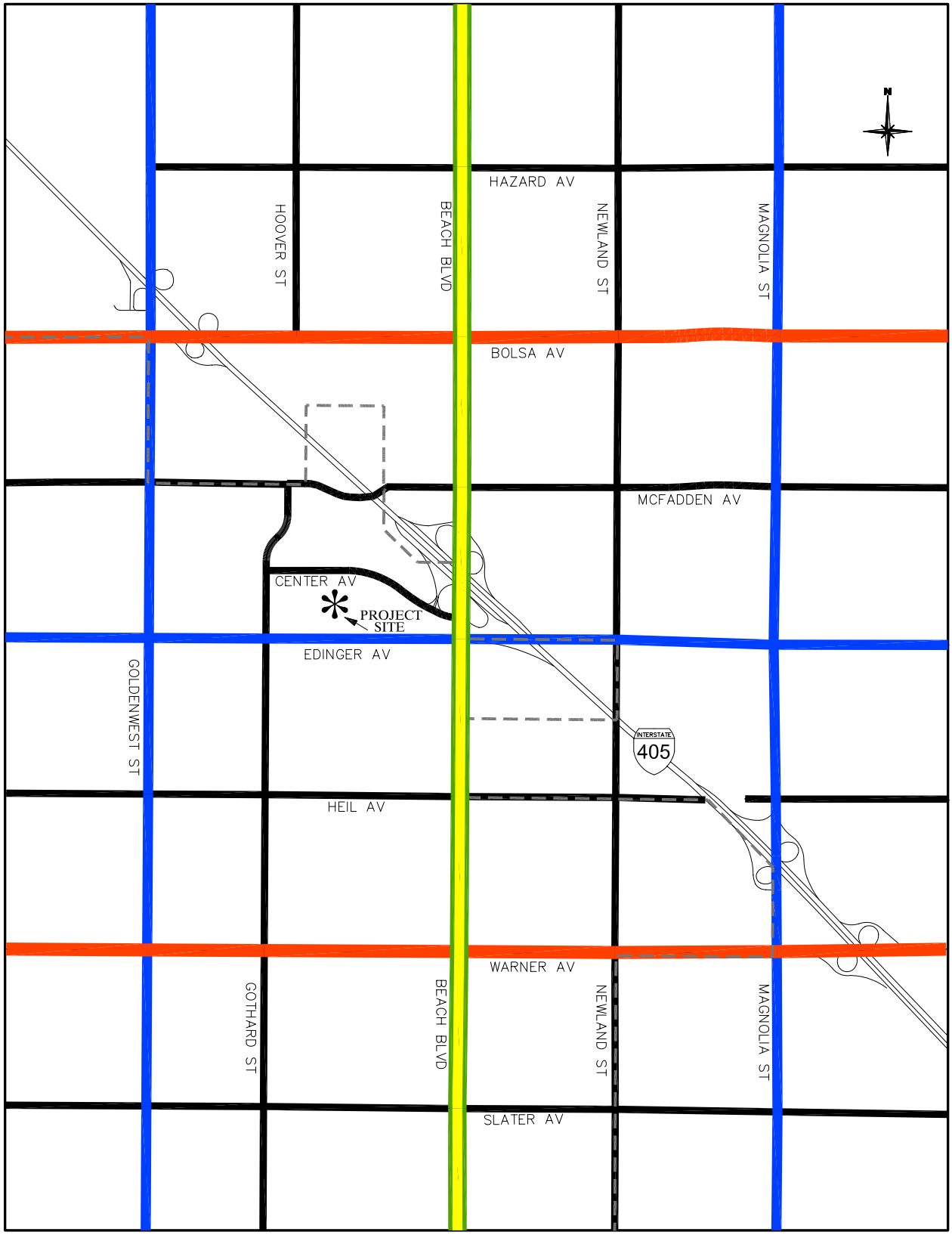
The intersection improvements (last two items in this table) are assumed in both the short-range and long-range analyses.

Table 2-2

EXISTING FREEWAY RAMP V/C SUMMARY

Location	AM Peak Hour			PM Peak Hour		
	Capacity	**Volume**	**V/C**	**Capacity**	**Volume**	**V/C**
I-405/Beach Blvd NB loop on-ramp (from NB Beach Blvd)	900	1,240	1.38	900	1,510	1.68
I-405/Beach Blvd NB loop off-ramp (to SB Beach Blvd)	1,200	690	.58	1,200	880	.73
I-405/Beach Blvd SB on-ramp at Center Ave	1,800	360	.20	1,800	960	.53
I-405/Beach Blvd SB off-ramp at Center Ave	1,500	950	.63	1,500	1,130	.75
I-405/Edinger Ave SB direct on-ramp	1,080	570	.53	1,080	570	.53

Source: Huntington Beach traffic count database and I-405 PSR/PDS



Legend

	Smart Street	(8 Lane roadway)
	Major	(6 Lane divided roadway)
	Primary	(4 Lane divided roadway)
	Secondary	(4 Lane undivided roadway)
	City Limits	

Figure 2-6

CURRENT MPAH

It should be noted that the City also uses an adopted Precise Plan of Street Alignment for establishing street dimensions in cases where right-of-way dedication is required.

FUTURE GROWTH

Future growth in the City of Huntington Beach is portrayed in the Orange County Projections (OCP) 2006 and also in the citywide land use database recently prepared by the City. The latter is the basis for long-range traffic forecasting and the Citywide growth statistics are as follows:

Category	2007	2030	Increase
Population	216,471	233,457	8%
Housing	76,890	83,396	8%
Employment	81,694	94,127	15%

These forecasts are similar to those in OCP-2006, and as can be seen they show an eight percent increase in population and housing and a 15 percent increase in employment by 2030 in Huntington Beach.

Long-range (2030) volumes used in this analysis are derived using the Huntington Beach Traffic Model (HBTM) as discussed in Chapter 1.0. The HBTM uses the land use projections listed above to forecast future traffic volumes on the citywide arterial street system.

For the short-range analysis, background (no-project) traffic volumes were derived by interpolating between existing and 2030 volumes. As noted earlier in this chapter, they generally represent a 2014 time frame and account for ambient growth and related projects during this time period. The 2014 analysis also provides the five to seven year time frame required for Growth Management Plan (GMP) and Congestion Management Program (CMP) purposes.

Chapter 3.0
PROJECT DESCRIPTION

This chapter describes the proposed project in terms of its traffic-related characteristics. The project trip generation, trip distribution and resulting project-generated traffic volumes on the study area circulation system are presented.

PROJECT DESCRIPTION

The Village at Bella Terra is a proposed mixed use development in the northeast part of the City of Huntington Beach. The site is located immediately west of the existing Bella Terra center between Edinger Avenue and Center Street with access to both roadways (see project site with access locations in Figure 3-1).

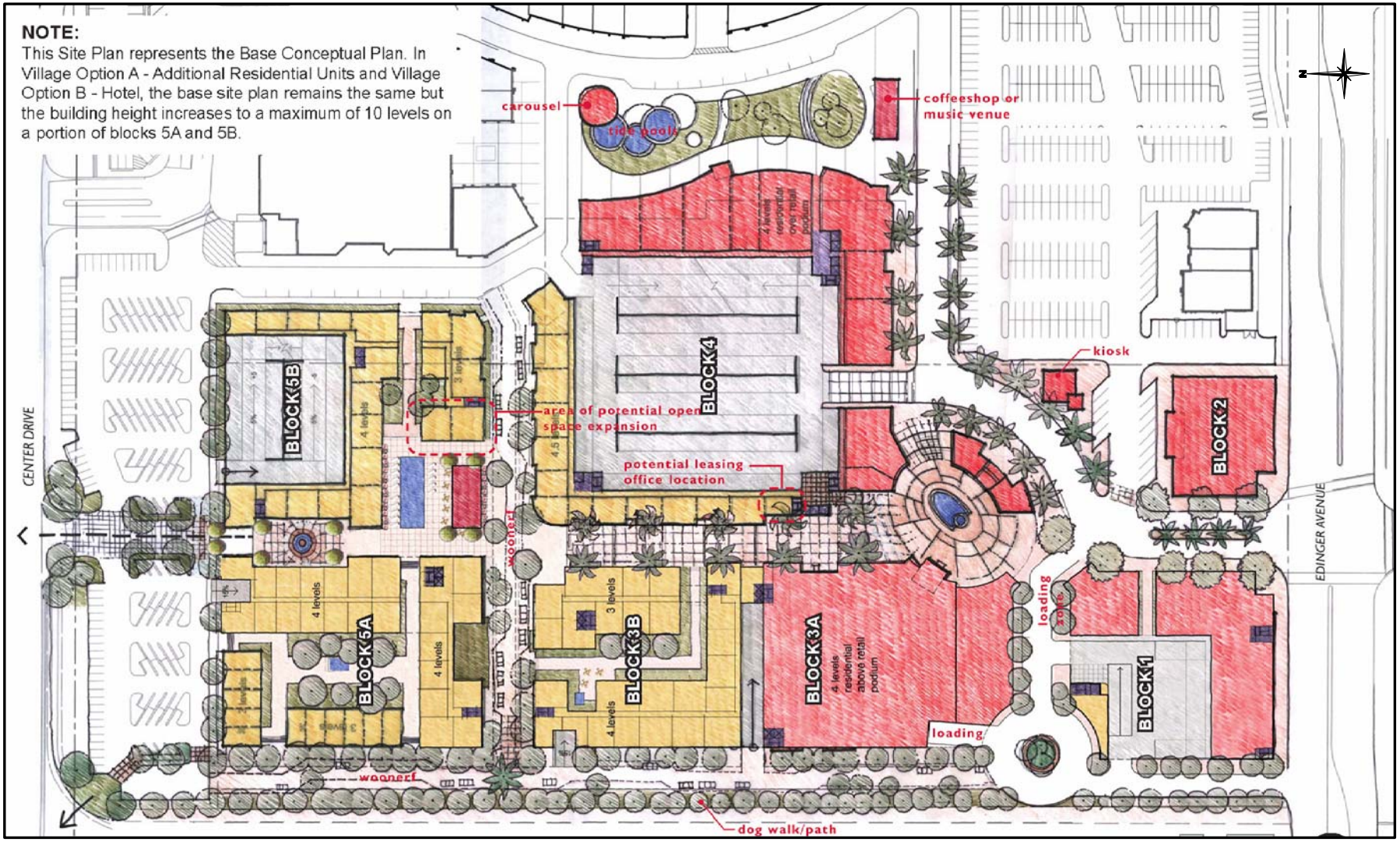
A General Plan Amendment (GPA) is being processed for the project, with two alternative levels of development analyzed here. The first is buildout under a proposed GPA with two potential development options as listed below. The second is an Alternative GPA with reduced development. The following are the land uses for each alternative/option:

Proposed GPA Option 1:	713 residential units 138,085 square feet of commercial uses
Proposed GPA Option 2:	538 residential units 165 room hotel 181,118 square feet of commercial uses
Alternative GPA: **(Reduced Project)**	538 residential units 138,085 square feet of commercial uses

By way of comparison, the current General Plan would allow 396 residential units and 345,213 square feet of commercial uses.

TRIP GENERATION

Trip generation rates for the project land uses were taken from the Institute of Transportation Engineers' (ITE) "Trip Generation" manual and involved a three-step process. In the first step, the



Source

PBS & J

Figure 3-1

PROJECT SITE PLAN

commercial trip generation was estimated by subtracting the trip generation for the existing Bella Terra retail uses from the trip generation for the total expanded retail uses (existing Bella Terra retail plus the proposed project commercial uses). This procedure, in which the trips are derived by subtracting existing from future, reflects the fact that shopping center trip generation rates decrease with size of the retail center (i.e., the rate of trip production per square foot of building area decreases as the overall size of the center increases).

The second step was to estimate the residential trip generation and the hotel trip generation, again using ITE rates. The results were used to derive project trip generation for the two options with respect to hotel uses (one option with a hotel and the other without a hotel, but with additional residential units).

The final step was to apply trip generation reductions for internal capture, local capture, and pass-by trips. Internal capture represents trips that do not leave the project area (in this case the existing plus expanded Bella Terra retail center). Local capture is similar to internal capture in that it represents a different mode of travel such as walking or bicycling rather than passenger vehicle trips to and from the immediately adjacent area. For an isolated residential project, the local capture would typically be close to zero. In this case, the surrounding area provides numerous walking destinations.

Pass-by trips are those that would be on the adjacent roadway system without the project and are diverted into the project site (i.e., they are not "new" trips as far as the adjacent roadway is concerned, although they are new trips as far as the project driveways are concerned). Sources such as the ITE Trip Generation Manual have been used to estimate this trip reduction.

For a mixed-use project with a large residential component and a small retail component, ITE provides guidelines for internal capture. However, for a large retail component and relatively small residential component, the ITE formula will result in overestimating the internal capture for the residential component (there are only a limited number of residential shopping trips available for such capture). When the existing retail and the proposed expansion are considered, the residential component is considered small in relation to the substantial amount of retail uses in the overall center. Hence, the approach used here has been to apply standard traffic modeling relationships to the residential trips by separating them into their individual trip purposes and then applying internal capture proportions to each trip purpose. A combined internal and local capture proportion is estimated in this manner, and the calculations are as follows:

RESIDENTIAL INTERNAL/LOCAL TRIP CAPTURE							
Trip Purpose	**AM Peak Hour Percent**	**PM Peak Hour Percent**	**ADT Percent**	**Capture Rate**	**AM Capture**	**PM Capture**	**ADT Capture**
Home-Based Work & School	70%	57%	44%	10%	7.0%	5.7%	4.4%
Home-Based Shopping	2%	11%	13%	50%	1.0%	5.5%	6.5%
Home-Based Social/Recreation	6%	12%	15%	40%	2.4%	4.8%	6.0%
Home-Based Other	22%	20%	28%	5%	1.1%	1.0%	1.4%
Total	100%	100%	100%	--	11.5%	17.0%	18.3%

The percentages by trip purpose are taken from the Citywide traffic model, and the capture rates are estimated as the realistic interaction between a retail center the size of Bella Terra and the surrounding commercial uses. The combined internal and local capture was also verified by examining trip interactions with the immediate area as estimated by the traffic model.

Separating internal and local components of these combined capture rates gives the following internal/local capture rates as a proportion of total trips for each time period:

	AM	**PM**	**ADT**
Internal Capture	4%	13%	14%
Local Capture	7%	4%	4%
Total	11%	17%	18%

These internal capture rates have been used in the trip generation results summarized in Table 3-1. For the residential component, ITE publishes trip generation rates for various residential use categories. The ITE trip generation rates for the Condominium category is less than the rates for the Apartment category. In order to present a conservative analysis, the higher trip generation rates for the Apartment category were applied to the proposed residential uses in this study, although it is recognized that some or all of the units proposed for this project are likely to be for-sale condominiums.

As can be seen from the trip generation results, both GPA options generate more AM peak hour trips and less PM peak hour and daily trips than the currently allowed General Plan land uses for the site. Under GPA Option 2 (with the hotel), the proposed project will generate 6,918 new daily trips, of which 385 will be in the AM peak hour and 628 in the PM peak hour. Since GPA Option 2 has higher AM peak hour, PM peak hour and daily trip generation than GPA Option 1, GPA Option 2 has been used in the impact analysis for the proposed GPA. GPA Option 2 is referred to in the traffic impact analysis portion of this report (i.e., Chapter 4.0) as “Proposed GPA Option 2” or simply “GPA Option 2.” For the

Table 3-1
BELLA TERRA TRIP GENERATION

Project Description	Amount	AM Peak Hour			PM Peak Hour			ADT
		In	Out	Total	In	Out	Total	
EXISTING DEVELOPMENT (BELLA TERRA PHASE I)								
Existing Commercial [1]	694,422 SF	306	195	501	1,080	1,169	2,249	23,933
Internal Capture *		--	--	--	65	70	135	957
Pass-by Reduction *		--	--	--	216	234	450	4,787
Subtotal		306	195	501	799	865	1,664	18,189
Multiplex Theaters w/ Matinee (4000 seats)	76,740 SF	0	0	0	297	263	560	3,067
Internal Capture *		--	--	--	60	53	113	889
Subtotal		0	0	0	237	210	447	2,178
Existing Trip Generation Total		**306**	**195**	**501**	**1,036**	**1,075**	**2,111**	**20,367**
CURRENT GENERAL PLAN (THE VILLAGE AT BELLA TERRA)								
Bella Terra Residential [2]	396 DU	40	162	202	158	87	245	2,661
Bella Terra Commercial [9]	345,213 SF	83	54	137	329	358	687	7,178
Internal Capture [4]		8	8	16	32	32	64	745
Local Capture [5]		3	11	14	6	3	9	106
Pass-by Reduction [6]		16	11	27	66	71	137	1,436
Phase II Trip Generation Total		**96**	**186**	**282**	**383**	**339**	**722**	**7,552**
PROPOSED GPA OPTION 1								
Bella Terra Residential [2]	713 DU	71	292	363	285	157	442	4,791
Bella Terra Commercial [3]	138,085 SF	34	23	57	137	149	286	2,994
Internal Capture [4]		14	14	28	57	57	114	1,341
Local Capture [5]		5	20	25	11	6	17	192
Pass-by Reduction [6]		7	5	12	27	30	57	599
Option 1 Project Trip Generation Total		**79**	**276**	**355**	**327**	**213**	**540**	**5,653**
PROPOSED GPA OPTION 2								
Bella Terra Residential [2]	538 DU	54	221	275	215	118	333	3,615
Bella Terra Hotel [7]	165 Rooms	56	36	92	51	46	97	1,348
Bella Terra Commercial [8]	181,118 SF	45	29	74	178	194	372	3,890
Internal Capture [4]		11	11	22	43	43	86	1,012
Local Capture [5]		4	15	19	9	5	14	145
Pass-by Reduction [6]		9	6	15	35	39	74	778
Option 2 Project Trip Generation Total		**131**	**254**	**385**	**357**	**271**	**628**	**6,918**
ALTERNATIVE GPA (REDUCED PROJECT)								
Bella Terra Residential [2]	538 DU	54	221	275	215	118	333	3,615
Bella Terra Commercial [10]	138,085 SF	34	23	57	137	149	286	2,994
Internal Capture [4]		11	11	22	43	43	86	1,012
Local Capture [5]		4	15	19	9	5	14	145
Pass-by Reduction [6]		7	5	12	27	30	57	599
Alternative GPA Trip Generation Total		**66**	**213**	**279**	**273**	**189**	**462**	**4,853**

(Cont.)

Table 3-1 (Cont.)
BELLA TERRA TRIP GENERATION

Land Use	Units	AM Peak Hour			PM Peak Hour			ADT
		In	Out	Total	In	Out	Total	
TOTAL EXISTING PLUS GENERAL PLAN		**402**	**381**	**783**	**1,419**	**1,414**	**2,833**	**27,919**
TOTAL EXISTING PLUS GPA OPTION 1		**385**	**471**	**856**	**1,363**	**1,288**	**2,651**	**26,020**
TOTAL EXISTING PLUS GPA OPTION 2		**437**	**449**	**886**	**1,393**	**1,346**	**2,739**	**27,285**
TOTAL EXISTING PLUS ALTERNATIVE GPA		**372**	**408**	**780**	**1,309**	**1,264**	**2,573**	**25,220**
Trip Rates								
Residential (220)	DU	.10	.41	.51	.40	.22	.62	6.72
Hotel (310)	Rooms	.34	.22	.56	.31	.28	.59	8.17
Multi-Plex Movie Theater (445)	Seats	--	--	--	.0743	.0658	.1400	.7668
Shopping Center (820)	TSF	AM Ln(T) = .60Ln(X) + 2.29			PM Ln(T) = .66Ln(X) + 3.40			ADT Ln(T) = .65Ln(X) + 5.83

* Internal Capture and Pass-by Reduction taken from Bella Terra Phase I Traffic Analysis.

Notes:

[1] Trips based on ITE (7th Ed.) Shopping Center (820) equation using total site commercial of 694,422 SF.

[2] Trips based on ITE (7th Ed.) Apartment (220) rates.

[3] Increase in trips based on ITE (7th Ed.) Shopping Center (820) equation using total site commercial of 832,507 SF.

[4] Based on residential trip generation capture of 4 percent for AM Peak Hour and 13 percent for PM Peak Hour and 14 percent for ADT. Includes the other end of the trip (i.e. the same number of trips but with reversed directionality for the commercial end).

[5] Based on residential local trip capture of 7 percent for AM Peak Hour and 4 percent for PM Peak Hour and 4 percent for ADT.

[6] Based on 20 percent of retail trip generation

[7] Trips based on ITE (7th Ed.) Hotel (310) rates.

[8] Increase in trips based on ITE (7th Ed.) Shopping Center (820) equation using total site commercial of 875,540 SF.

[9] Increase in trips based on ITE (7th Ed.) Shopping Center (820) equation using total site commercial of 1,039,635 SF.

[10] Increase in trips based on ITE (7th Ed.) Shopping Center (820) equation using total site commercial of 832,507 SF.

Alternative GPA, the ADT trip generation is 4,853 daily trips with 279 in the AM peak hour and 462 in the PM peak hour.

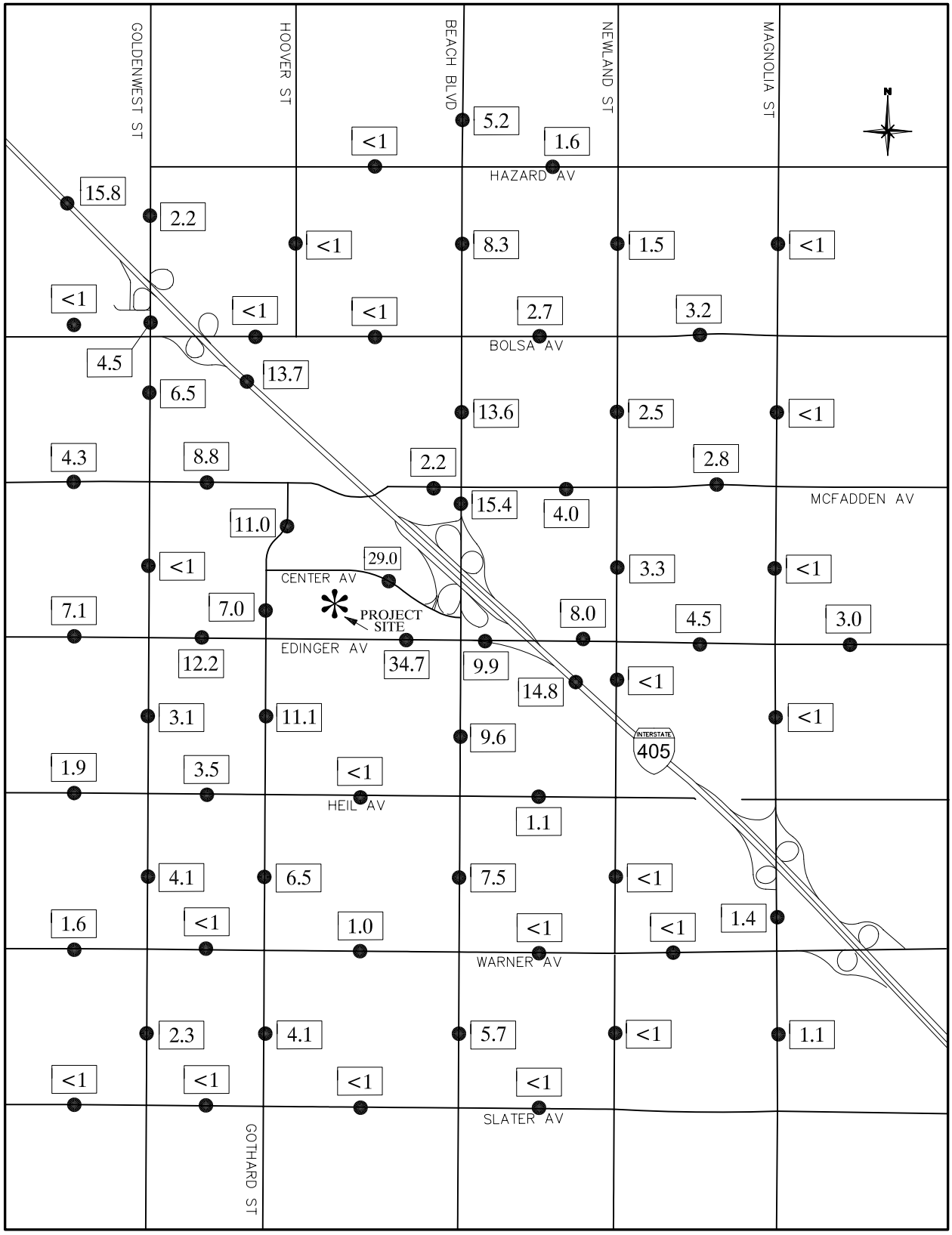
TRIP DISTRIBUTION

The geographic distribution of trips in the study area to and from the project was estimated using regional distribution patterns derived from the Huntington Beach Traffic Model (HBTM). The resulting project trip distribution pattern is illustrated in Figure 3-2. It is based on the distribution of daily trips generated by the project as assigned to the study area street system. Peak hour project trips differ slightly with respect to their distribution patterns, as do the inbound versus outbound distribution of those peak hour project trips. These differences are reflected in the actual project volumes used in the impact analysis.

Figure 3-3 shows the ADT project trips for the GPA project and Figure 3-4 shows the corresponding data for the Alternative GPA. These ADT project trips and the project peak hour intersection volumes given in Appendix A are used in the short-range analysis to estimate project impacts.

LONG-RANGE ANALYSIS

The long-range analysis compares the two projects (proposed GPA and Alternative GPA) with buildout of the current General Plan land uses on the project site. The incremental trip generation changes (i.e., proposed project versus current General Plan) used in the analysis are summarized in Table 3-2. Compared to the current General Plan, the proposed GPA Option 2 has higher inbound and outbound AM peak hour volumes and the Alternative GPA has higher outbound AM peak hour volumes. The Alternative GPA AM inbound volumes are lower than the current General Plan, as are the PM peak hour and ADT volumes for both the GPA and the Alternative GPA.

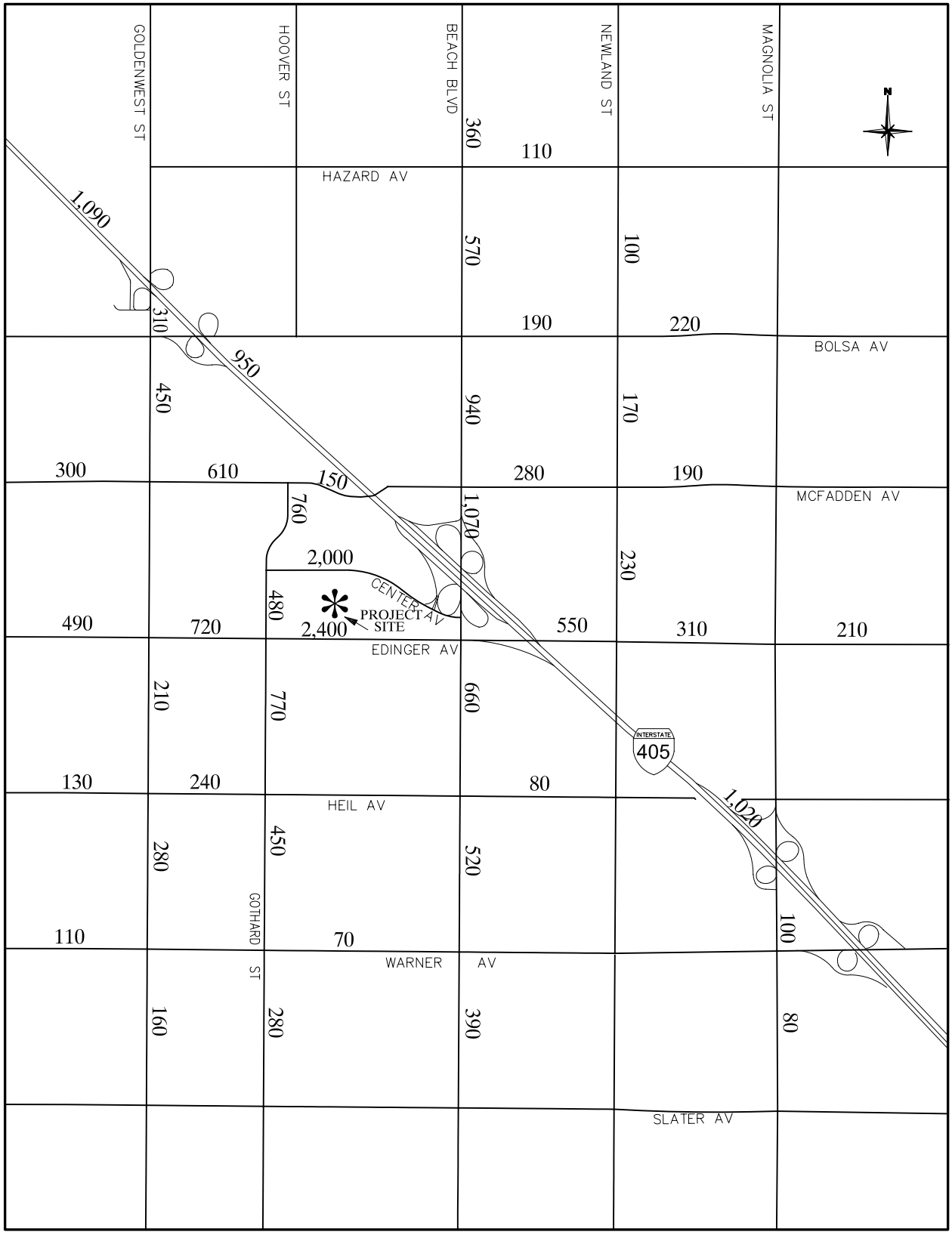


Legend

XX = Distribution %

Figure 3-2

PROJECT TRIP DISTRIBUTION



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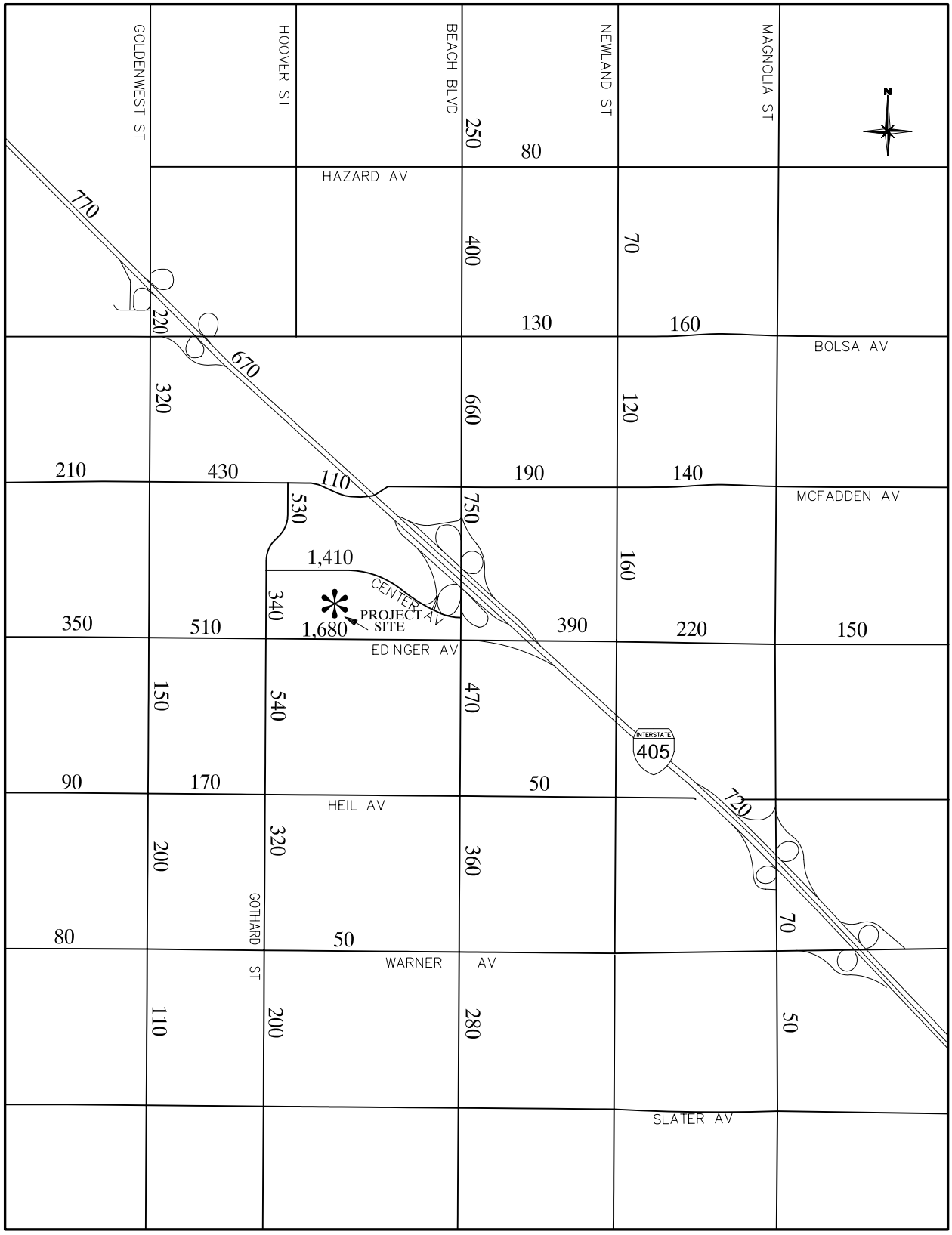
XX Project ADT

Figure 3-3

PROJECT-ONLY ADT VOLUMES
- PROPOSED GPA OPTION 2



Legend

XX Project ADT

Figure 3-4

PROJECT-ONLY ADT VOLUMES
- ALTERNATIVE GPA

Table 3-2

BELLA TERRA TRIP GENERATION – PROPOSED PROJECT VERSUS GENERAL PLAN

Description	AM Peak Hour			PM Peak Hour			ADT
	In	**Out**	**Total**	**In**	**Out**	**Total**	
EXISTING PLUS CURRENT GENERAL PLAN	402	381	783	1,419	1,414	2,833	27,919
GPA OPTION 2							
EXISTING PLUS GPA OPTION 2	437	449	886	1,393	1,346	2,739	27,285
DIFFERENCE	35	68	103	-26	-68	-89	-634
ALTERNATIVE GPA							
EXISTING PLUS ALTERNATIVE GPA	372	408	780	1,309	1,264	2,573	25,220
DIFFERENCE	-30	27	-3	-110	-150	-260	-2,699

Chapter 4.0
IMPACT ANALYSIS

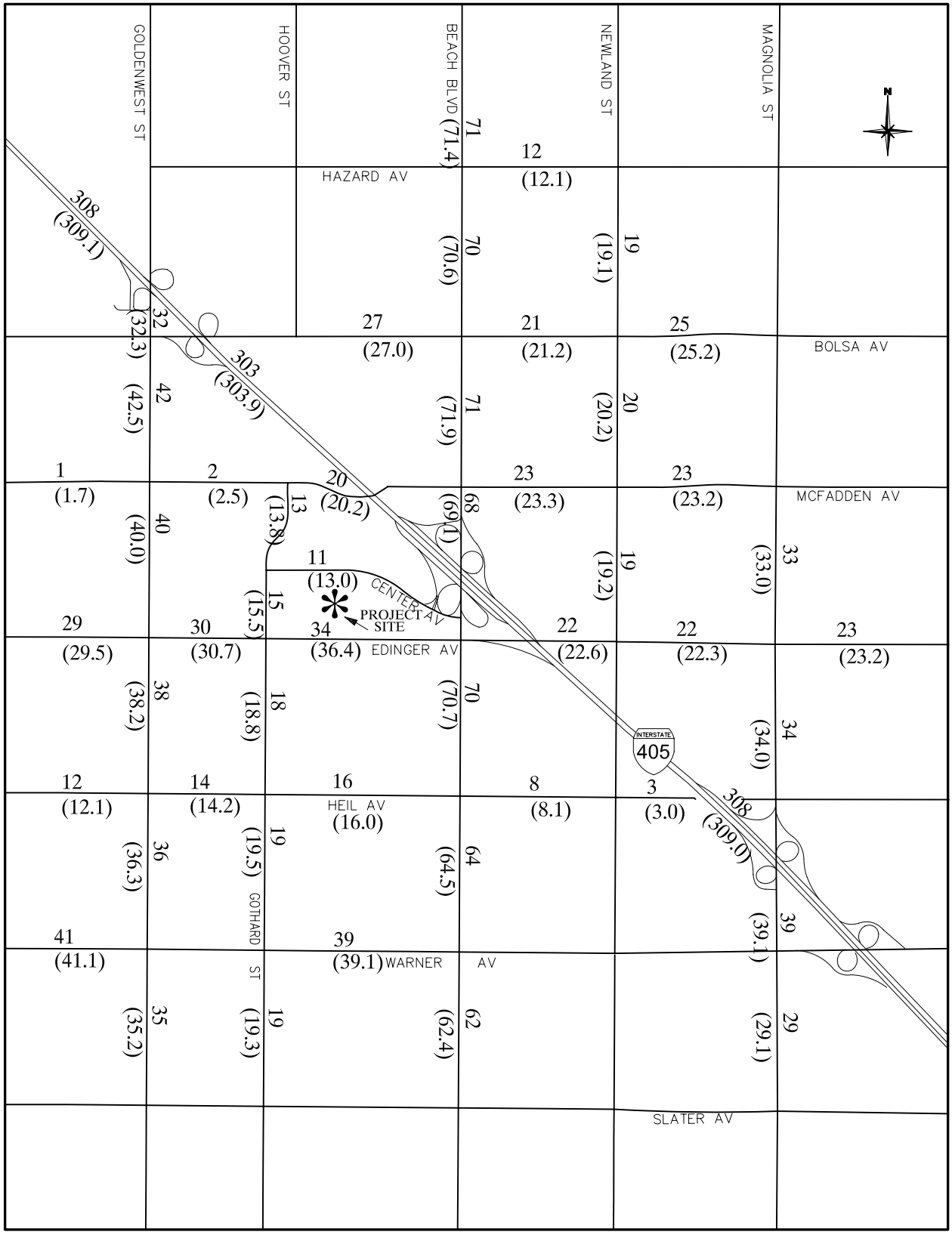
This chapter discusses the traffic impacts of the project. Both short-range and long-range results are presented using the methodologies and performance criteria described in Chapter 1.0. The analysis has separate sets of results for the proposed General Plan Amendment (GPA) project and for the Alternative GPA project.

SHORT-RANGE ANALYSIS

The short-range analysis compares no development on the project site to buildout of the project under the Proposed GPA Option 2 or the Alternative GPA. Average daily traffic (ADT) volumes for 2014 are illustrated in Figures 4-1 and 4-2. The first diagram gives no-project and with-project volumes for the Proposed GPA Option 2. The second diagram contains the same information for the Alternative GPA.

The no-project AM and PM peak hour intersection volumes for 2014 can be found in Appendix A. To derive the corresponding with-project volumes, the project-only peak hour intersection volumes presented in Chapter 3.0 were added to these no-project background volumes. The with and without project intersection capacity utilization (ICU) values were then calculated and used to identify project impacts. This section presents the results of that analysis. For Caltrans intersections, a separate set of calculations were made using the Highway Capacity Manual (HCM) methodology, and the HCM results can be found later in this chapter.

A summary of 2014 with and without project ICU values is given in Table 4-1 (actual intersection volumes are provided in Appendix A and ICU calculations can be found in Appendix B). For the three intersections at LOS “E”, a determination was made as to whether the project contribution amounted to one percent or more in accordance with the performance criteria for significant project impacts. This was carried out by summing the project traffic ICU contribution to each critical movement in the ICU calculation. For the Proposed GPA Option 2, the results are as follows:

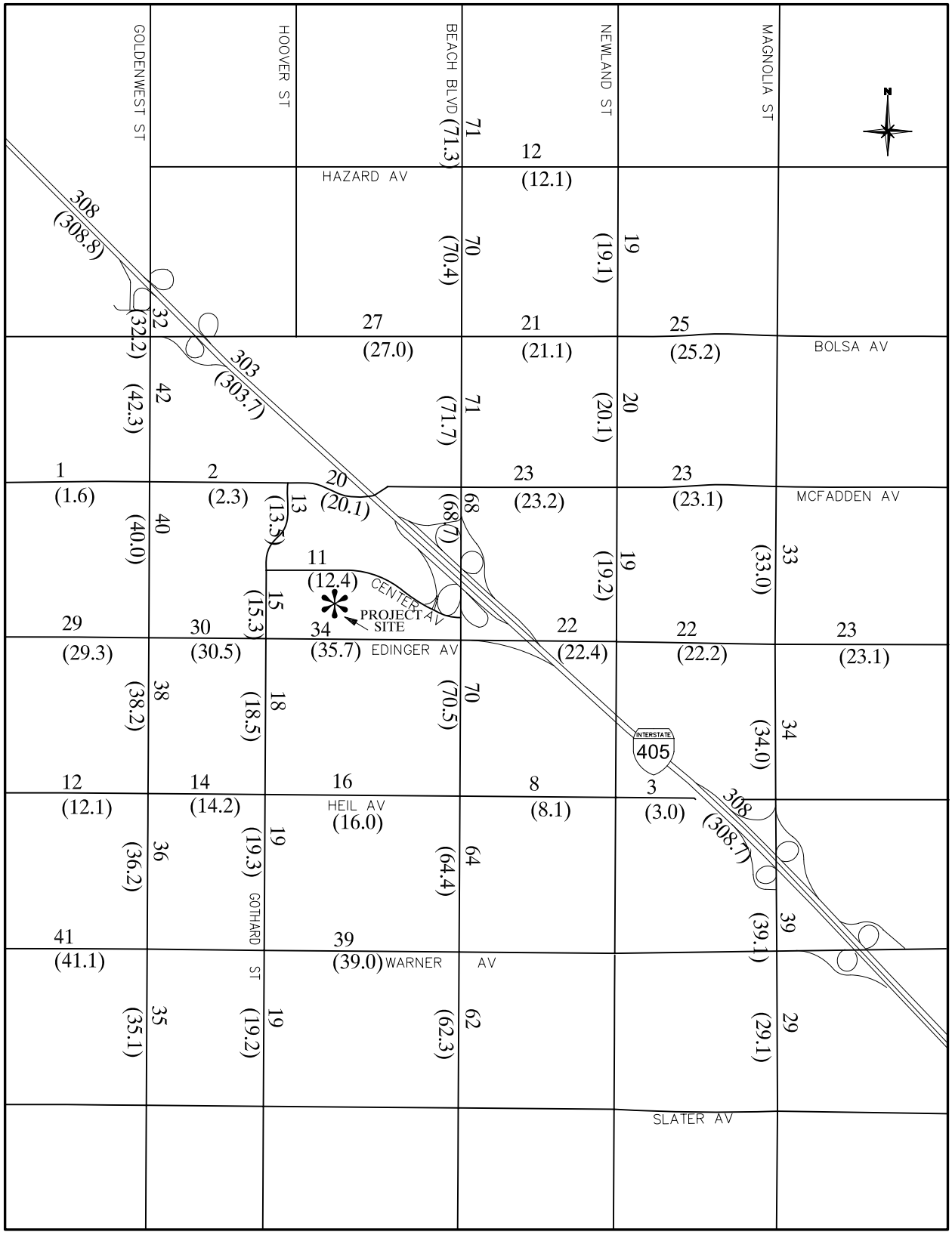


Legend

XX / (Y.Y) — No-Project ADT (000s) / With-Project ADT (000s)

Figure 4-1

STUDY AREA ADT VOLUMES (000s)
- YEAR 2014
- PROPOSED GPA OPTION 2



Legend

XX / (Y.Y) — No-Project ADT (000s) / With-Project ADT (000s)

Figure 4-2

STUDY AREA ADT VOLUMES (000s)
- YEAR 2014
- ALTERNATIVE GPA

Table 4-1

2014 INTERSECTION LEVEL OF SERVICE SUMMARY

	No-Project				Proposed GPA Option 2				Alternative GPA			
	AM		PM		AM		PM		AM		PM	
Intersection	**ICU**	**LOS**	**ICU**	**LOS**	**ICU**	**LOS**	**ICU**	**LOS**	**ICU**	**LOS**	**ICU**	**LOS**
8. Goldenwest Ave & Bolsa Ave	.74	C	.91	E*	.74	C	.91	E*	.74	C	.91	E*
15. Goldenwest Ave & McFadden Ave	.71	C	.75	C	.71	C	.76	C	.71	C	.75	C
16. Gothard St & McFadden Ave	.52	A	.55	A	.54	A	.55	A	.52	A	.55	A
17. Gothard St & Center Ave	.30	A	.50	A	.32	A	.53	A	.31	A	.52	A
18. I-405 SB Ramps & Center Ave	.44	A	.80	C	.45	A	.80	C	.45	A	.80	C
19. Beach Blvd & Center Ave	.71	C	.71	C	.71	C	.72	C	.71	C	.72	C
26. Goldenwest St & Edinger Ave	.63	B	.63	B	.63	B	.65	B	.63	B	.65	B
27. Gothard St & Edinger Ave	.49	A	.58	A	.50	A	.60	A	.49	A	.59	A
28. Beach Blvd & Edinger Ave	.73	C	.92	E*	.74	C	.95	E*	.74	C	.94	E*
29. Newland St & Edinger Ave	.76	C	.70	B	.76	C	.70	B	.76	C	.70	B
36. Gothard St & Heil Ave	.61	B	.67	B	.61	B	.68	B	.61	B	.67	B
37. Beach Blvd & Heil Ave	.76	C	.82	D	.76	C	.82	D	.76	C	.82	D
38. Newland St & Heil Ave	.55	A	.51	A	.55	A	.51	A	.55	A	.51	A
46. Gothard St & Warner Ave	.59	A	.79	C	.59	A	.80	C	.59	A	.80	C
47. Beach Blvd & Warner Ave	.72	C	.92	E*	.72	C	.92	E*	.72	C	.92	E*
48. Newland St & Warner Ave	.83	D	.87	D	.83	D	.87	D	.83	D	.87	D
250. Beach Blvd & McFadden Ave	.80	C	.85	D	.81	D	.85	D	.80	C	.85	D
251. Beach Blvd & Bolsa Ave	.85	D	.87	D	.85	D	.87	D	.85	D	.87	D
252. Beach Blvd & Hazard Ave	.69	B	.73	C	.69	B	.74	C	.69	B	.73	C
253. Magnolia St & Edinger Ave	.80	C	.70	B	.80	C	.71	C	.80	C	.71	C

* Exceeds performance criteria of LOS “D” (ICU to not exceed .90)

Level of service ranges: .00 - .60 A
.61 - .70 B
.71 - .80 C
.81 - .90 D
.91 – 1.00 E
Above 1.00 F

Location	AM/PM	PROJECT ICU
8. Goldenwest & Bolsa	PM	0.35%
28. Beach & Edinger	PM	1.86%
47. Beach & Warner	PM	0.50%

As can be seen, there is a significant project ICU contribution at the Beach Boulevard/Edinger Avenue intersection. Potential mitigation measures for this impact are discussed later in this chapter.

For the Alternative GPA, the project traffic ICU contributions are as follows:

Location	AM/PM	PROJECT ICU
8. Goldenwest & Bolsa	PM	0.26%
28. Beach & Edinger	PM	1.34%
47. Beach & Warner	PM	0.38%

The project has a significant ICU contribution at the same location as for the GPA project, and potential mitigation measures that address this impact are discussed later in this chapter.

LONG-RANGE ANALYSIS

As discussed in the methodology section, the long-range analysis compares the current General Plan to the proposed GPA and to the Alternative GPA project. The 2030 ADT volumes for the current General Plan can be seen in Figure 4-3 and intersection volumes for current General Plan conditions can be found in Appendix A. These form the baseline against which the two proposed projects are compared.

Figures 4-4 and 4-5 show the ADT reductions that would occur to the 2030 current General Plan volumes under the proposed GPA Option 2 and the Alternative GPA, respectively. The actual 2030 ADT volumes with the proposed GPA and the Alternative GPA are given in Figures 4-6 and 4-7, respectively.

With-project 2030 AM and PM peak hour intersection volumes were derived by applying the volume differences (current General Plan versus proposed project) at each individual intersection to the 2030 current General Plan volumes (Appendix A shows the actual differences and the resulting intersection volumes). The project volumes thereby reflect the trip generation differences between the current General Plan and the proposed projects (GPA and Alternative GPA).

A summary of the 2030 ICU values can be found in Table 4-2 (see Appendix B for actual ICU calculations). Seven intersections show long-range deficiencies (ICU greater than 0.90). The proposed

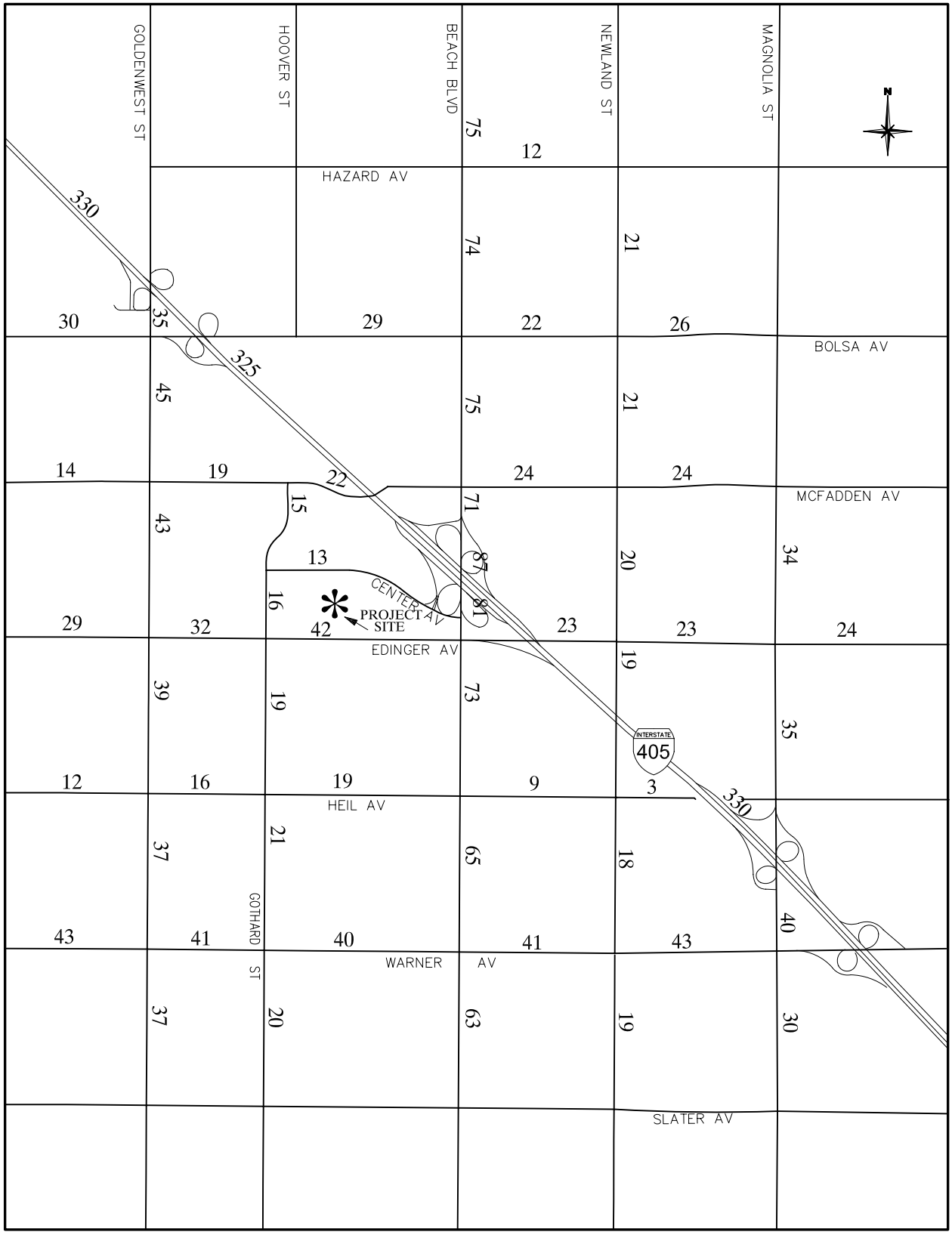
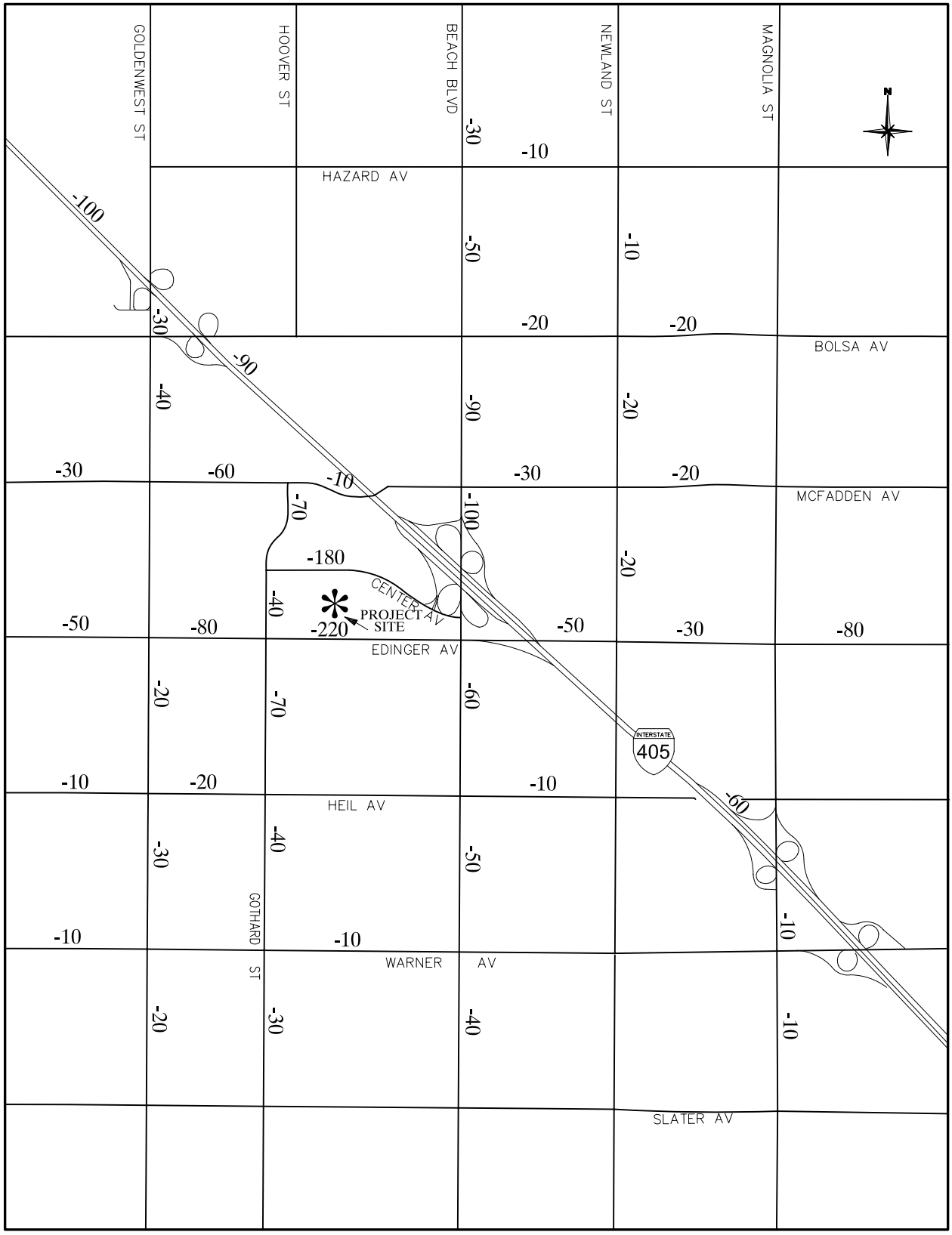


Figure 4-3

YEAR 2030 ADT VOLUMES (000s)
- GENERAL PLAN

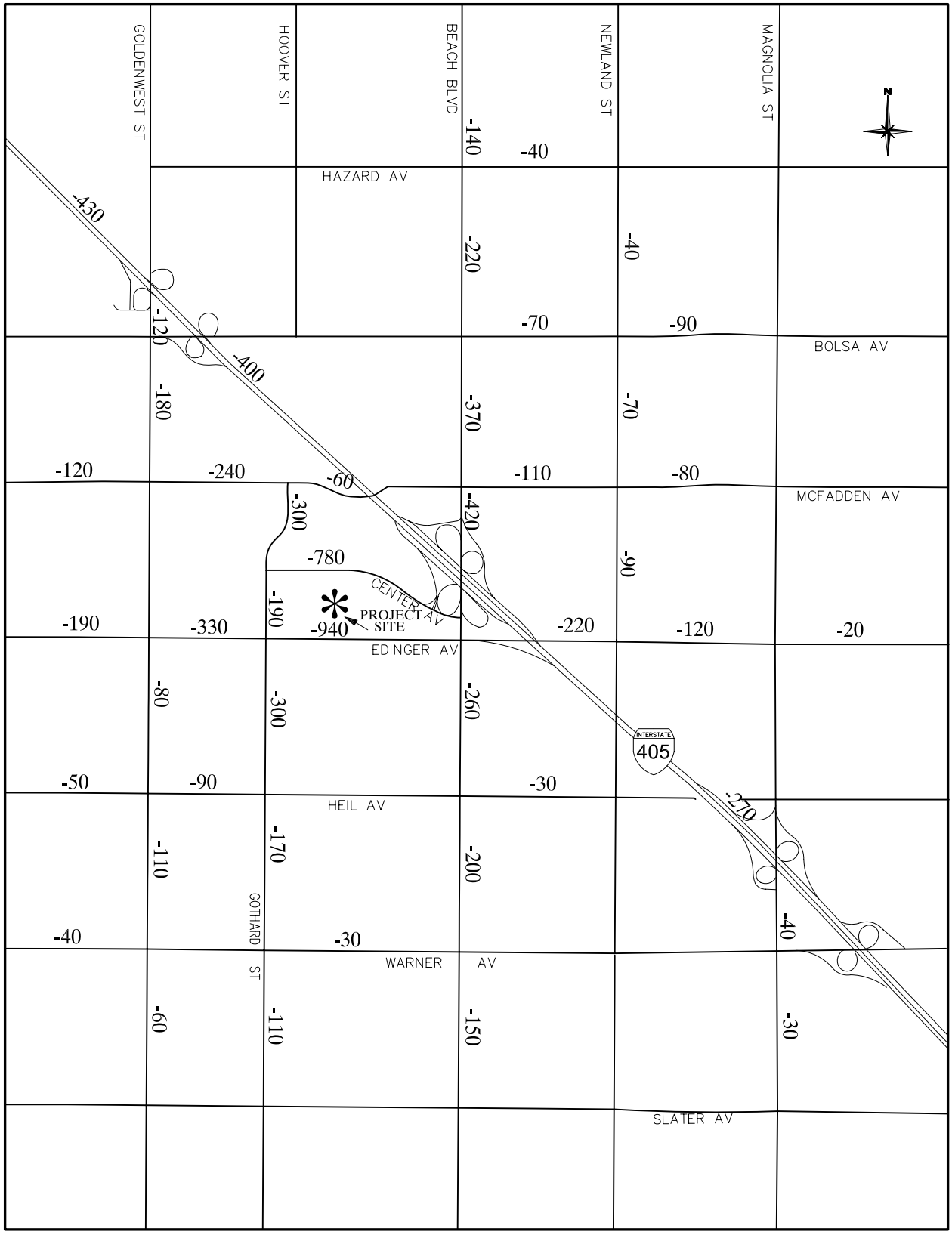


Legend

XX Project ADT

Figure 4-4

ADT DIFFERENCE VOLUMES
- GENERAL PLAN VERSUS
PROPOSED GPA OPTION 2



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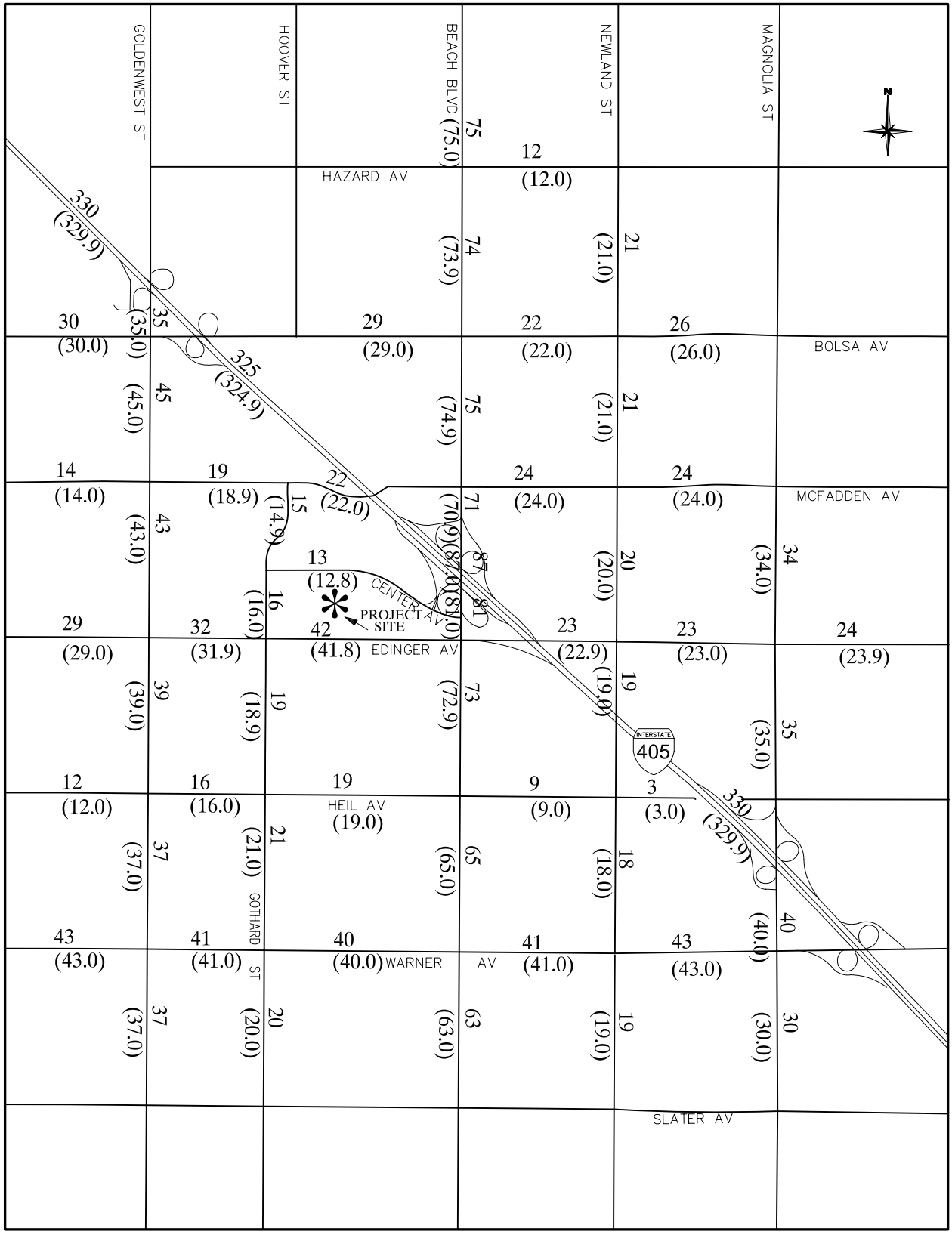
XX Project ADT

Figure 4-5

ADT DIFFERENCE VOLUMES
- GENERAL PLAN VERSUS ALTERNATIVE GPA

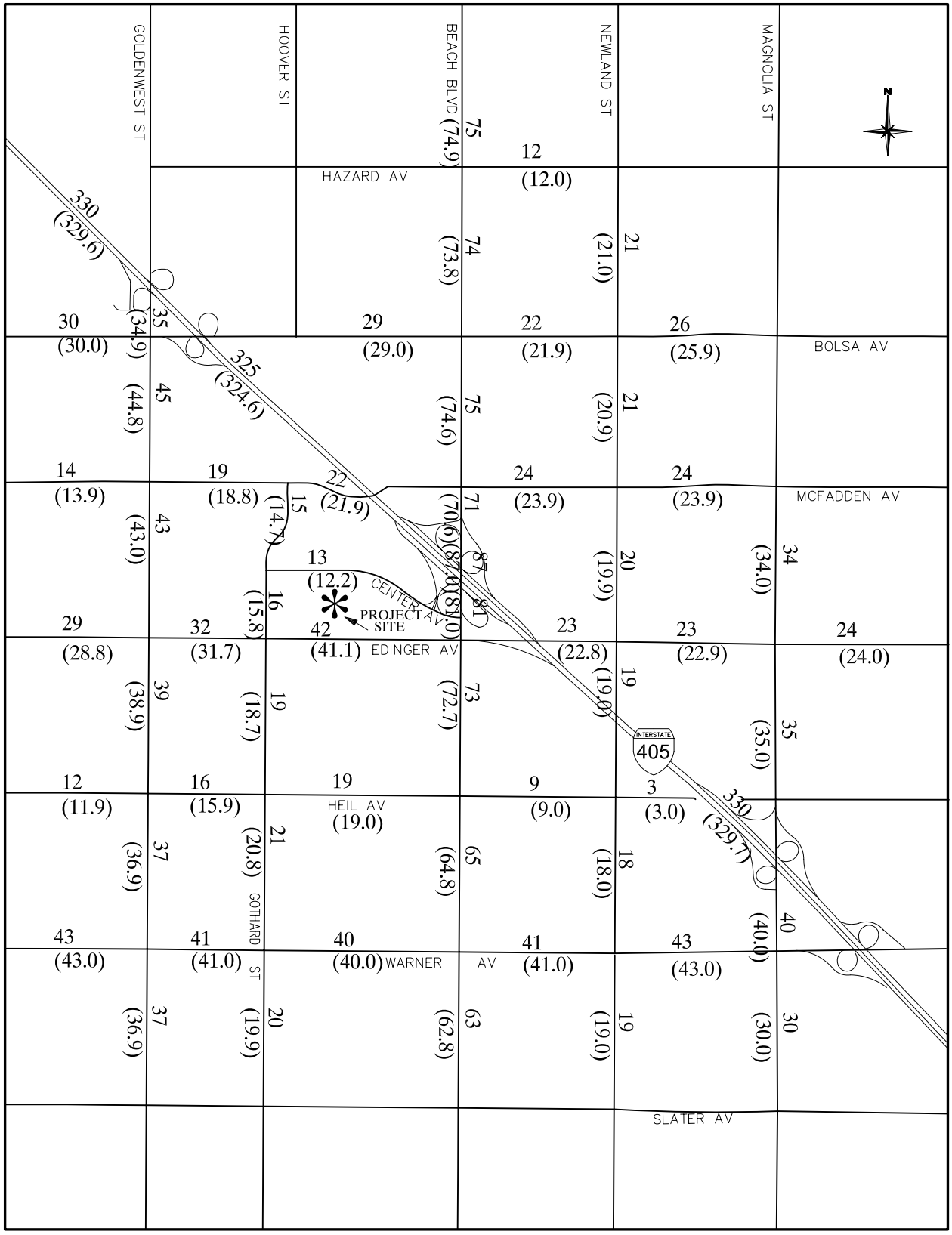


Legend

XX / (Y.Y) — General Plan ADT (000s) / With-Project ADT (000s)

Figure 4-6

YEAR 2030 ADT VOLUMES (000s)
- PROPOSED GPA OPTION 2



Legend

$\frac{XX}{(Y.Y)}$ General Plan ADT (000s)
With-Project ADT (000s)

Figure 4-7

YEAR 2030 ADT VOLUMES (000s)
- ALTERNATIVE GPA

Table 4-2

2030 INTERSECTION LEVEL OF SERVICE SUMMARY

	Current General Plan				Proposed GPA Option 2				Alternative GPA			
	AM		PM		AM		PM		AM		PM	
Intersection	**ICU**	**LOS**	**ICU**	**LOS**	**ICU**	**LOS**	**ICU**	**LOS**	**ICU**	**LOS**	**ICU**	**LOS**
8. Goldenwest Ave & Bolsa Ave	.90	D	1.02	F*	.90	D	1.02	F*	.90	D	1.02	F*
15. Goldenwest Ave & McFadden Ave	.82	D	.81	D	.83	D	.81	D	.82	D	.81	D
16. Gothard St & McFadden Ave	.67	B	.64	B	.67	B	.64	B	.66	B	.64	B
17. Gothard St & Center Ave	.36	A	.57	A	.36	A	.57	A	.35	A	.56	A
18. I-405 SB Ramps & Center Ave	.55	A	.90	D	.55	A	.90	D	.55	A	.90	D
19. Beach Blvd & Center Ave	.78	C	.77	C	.78	C	.77	C	.78	C	.76	C
26. Goldenwest St & Edinger Ave	.66	B	.70	B	.66	B	.70	B	.66	B	.70	B
27. Gothard St & Edinger Ave	.55	A	.64	B	.55	A	.64	B	.55	A	.63	B
28. Beach Blvd & Edinger Ave	.86	D	1.05	F*	.86	D	1.05	F*	.86	D	1.05	F*
29. Newland St & Edinger Ave	.87	D	.80	C	.87	D	.80	C	.87	D	.80	C
36. Gothard St & Heil Ave	.73	C	.78	C	.73	C	.78	C	.73	C	.78	C
37. Beach Blvd & Heil Ave	.83	D	.95	E*	.83	D	.95	E*	.83	D	.95	E*
38. Newland St & Heil Ave	.63	B	.63	B	.63	B	.63	B	.63	B	.63	B
46. Gothard St & Warner Ave	.65	B	.84	D	.65	B	.84	D	.65	B	.84	D
47. Beach Blvd & Warner Ave	.78	C	.96	E*	.78	C	.96	E*	.78	C	.95	E*
48. Newland St & Warner Ave	.88	D	.92	E*	.88	D	.92	E*	.88	D	.92	E*
250. Beach Blvd & McFadden Ave	.91	E*	.95	E*	.91	E*	.95	E*	.91	E*	.94	E*
251. Beach Blvd & Bolsa Ave	.96	E*	1.06	F*	.96	E*	1.05	F*	.96	E*	1.05	F*
252. Beach Blvd & Hazard Ave	.80	C	.83	D	.80	C	.83	D	.80	C	.83	D
253. Magnolia St & Edinger Ave	.88	D	.78	C	.88	D	.78	C	.88	D	.78	C

* Exceeds performance criteria of LOS “D” (ICU not greater than .90)

Level of service ranges: .00 - .60 A
.61 - .70 B
.71 - .80 C
.81 - .90 D
.91 – 1.00 E
Above 1.00 F

project does not increase the ICU compared to the current General Plan at any of the seven deficient intersections, and hence under the 2030 plan-to-plan analysis, there are no project impacts.

For the intersections at LOS "E" or worse, a determination was made as to whether the project contribution to the ICU amounted to one percent or more. This was carried out by summing the project traffic ICU contribution to each critical movement in the ICU calculation. It should be noted that this is different than the project versus General Plan traffic volumes used in the ICU comparisons since it uses actual project volumes rather than difference volumes (i.e., General Plan versus GPA). It is intended to show how development of this site will contribute to long-range deficiencies at the identified locations.

For the GPA, the project contribution results are as follows:

Location	**AM/PM**	**PROJECT ICU**
8. Goldenwest & Bolsa	PM	0.35%
28. Beach & Edinger	PM	1.86%
37. Beach & Heil	PM	0.29%
47. Beach & Warner	PM	0.50%
250. Beach & McFadden	AM	0.44%
250. Beach & McFadden	PM	0.91%
251. Beach & Bolsa	AM	0.16%
251. Beach & Bolsa	PM	0.32%

Hence, the project has a significant contribution to the long-range deficiency at Beach Boulevard/Edinger Avenue.

The corresponding project traffic ICU contributions for the Alternative GPA are as follows:

Location	**AM/PM**	**PROJECT ICU**
8. Goldenwest & Bolsa	PM	0.26%
28. Beach & Edinger	PM	1.34%
37. Beach & Heil	PM	0.21%
47. Beach & Warner	PM	0.38%
250. Beach & McFadden	AM	0.24%
250. Beach & McFadden	PM	0.63%
251. Beach & Bolsa	AM	0.07%
251. Beach & Bolsa	PM	0.24%

Hence, the Alternative GPA project has a significant project contribution to the long-range deficiency at the same intersection as for the GPA project.

FREEWAY RAMP VOLUMES

A summary of the 2014 and 2030 peak hour volumes and volume/capacity (V/C) ratios for freeway ramps that would be affected by the proposed project can be found in Table 4-3. Included in the table are the project contributions to the ramp V/C ratios.

As can be seen, the project has a significant impact to the northbound I-405 loop ramp from Beach Boulevard in 2014 (the project has a significant V/C contribution to a future deficiency with and without the project). The same situation occurs in the long-range, although the V/C would be of similar magnitude under the current General Plan.

CALTRANS INTERSECTIONS

A LOS analysis for 2014 and 2030 was carried out for the Caltrans intersections in the study area using the HCM methodology as described in Chapter 1.0. The calculations were made using Synchro 6.0 software, and for Beach Boulevard the intersections along Beach Boulevard were modeled as a network. The results are summarized in Tables 4-4 and 4-5 for the GPA and Alternative GPA project, respectively (note that existing LOS values using the HCM methodology were summarized in Chapter 2.0.) In general, the results give similar LOS values compared to those derived using ICU values. It should be noted that Caltrans intersections for the Goldenwest Street interchange are not included. Only six project trips in the AM and eight project trips in the PM access the freeway of this location, and with such low volumes there would be no measurable impacts (for this reason the study area did not extend north of Bolsa Avenue).

MITIGATION MEASURES

The project has a significant impact at the Beach Boulevard and Edinger Avenue intersection in the short-range time frame (it has a significant contribution to a cumulative deficiency rather than actually causing the deficiency). For the long-range, the 2030 plan-to-plan analysis (i.e., current General Plan versus proposed project) shows no change to the peak hour ICU values with the proposed GPA or the Alternative GPA. However, both the proposed GPA and the Alternative GPA have a significant contribution of project traffic (1.86 percent and 1.34 percent, respectively) to the deficient long-range PM peak hour ICU values at the Beach Boulevard/Edinger Avenue intersection.

Table 4-3

FUTURE FREEWAY RAMP V/C SUMMARY

Location	Capacity	AM Peak Hour				PM Peak Hour			
		Total Volume	Total V/C	Project Volume	Project V/C *	Total Volume	Total V/C	Project Volume	Project V/C *
YEAR 2014									
	GPA Option 2								
I-405/Beach Blvd NB loop on-ramp (from NB Beach Blvd)	900	1,333	1.48	35	.04	1,609	1.79	37	.04
I-405/Beach Blvd NB loop off-ramp (to SB Beach Blvd)	1,200	793	.66	19	.01	1,002	.84	52	.04
I-405/Beach Blvd SB on-ramp at Center Ave	1,800	465	.26	15	.01	1,046	.58	16	.01
I-405/Beach Blvd SB off-ramp at Center Ave	1,500	1,017	.68	17	.01	1,227	.82	47	.03
I-405/Edinger Ave SB direct on-ramp	1,080	695	.64	23	.02	717	.66	24	.02
	Alternative GPA								
I-405/Beach Blvd NB loop on-ramp (from NB Beach Blvd)	900	1,327	1.47	29	.03	1,598	1.78	26	.03
I-405/Beach Blvd NB loop off-ramp (to SB Beach Blvd)	1,200	784	.65	10	.01	990	.83	40	.03
I-405/Beach Blvd SB on-ramp at Center Ave	1,800	463	.26	13	.01	1,041	.58	11	.01
I-405/Beach Blvd SB off-ramp at Center Ave	1,500	1,009	.67	9	.01	1,216	.81	36	.02
I-405/Edinger Ave SB direct on-ramp	1,080	691	.64	19	.02	710	.66	17	.02

(cont)

Table 4-3 (cont)
FUTURE FREEWAY RAMP V/C SUMMARY

Location	Capacity	AM Peak Hour				PM Peak Hour			
		Total Volume	Total V/C	Project Volume	Project V/C *	Total Volume	Total V/C	Project Volume	Project V/C *
YEAR 2030									
	GPA Option 2								
I-405/Beach Blvd NB loop on-ramp (from NB Beach Blvd)	900	1,445	1.61	35	.04	1,717	1.91	37	.04
I-405/Beach Blvd NB loop off-ramp (to SB Beach Blvd)	1,200	869	.72	19	.02	1.052	.88	52	.04
I-405/Beach Blvd SB on-ramp at Center Ave	1,800	634	.35	15	.01	1,186	.66	16	.01
I-405/Beach Blvd SB off-ramp at Center Ave	1,500	1,115	.74	17	.01	1,297	.87	47	.03
I-405/Edinger Ave SB direct on-ramp	1,080	885	.82	23	.02	770	.71	24	.02
	Alternative GPA								
I-405/Beach Blvd NB loop on-ramp (from NB Beach Blvd)	900	1,439	1.60	29	.03	1,706	1.90	26	.03
I-405/Beach Blvd NB loop off-ramp (to SB Beach Blvd)	1,200	860	.72	10	.01	1,040	.87	40	.03
I-405/Beach Blvd SB on-ramp at Center Ave	1,800	632	.35	13	.01	1,181	.66	11	.01
I-405/Beach Blvd SB off-ramp at Center Ave	1,500	1,107	.74	9	.01	1,286	.86	36	.02
I-405/Edinger Ave SB direct on-ramp	1,080	881	.82	19	.02	763	.71	17	.02

* Project contribution to the total V/C ratio.

Table 4-4

2014 LEVEL OF SERVICE SUMMARY FOR CALTRANS INTERSECTIONS

	2014 With Project (Proposed GPA Option 2)				**2014 With Project (Alternative GPA)**			
	AM Peak Hour		**PM Peak Hour**		**AM Peak Hour**		**PM Peak Hour**	
Location	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
18. I-405 SB Ramps & Center	32.8	C	38.4	D	33.0	C	38.5	D
19. Beach & Center	16.4	B	18.9	B	16.3	B	18.7	B
28. Beach & Edinger	66.0	E	59.1	E	65.4	E	58.0	E
37. Beach & Heil	17.0	B	18.0	B	17.0	B	17.9	B
47. Beach & Warner	34.1	C	53.4	D	34.1	C	53.2	D
250. Beach & McFadden	31.5	C	40.8	D	31.2	C	40.2	D
251. Beach & Bolsa	36.6	D	39.1	D	36.3	D	39.0	D
252. Beach & Hazard	25.7	C	29.1	C	23.6	C	29.9	C

Table 4-5

2030 LEVEL OF SERVICE SUMMARY FOR CALTRANS INTERSECTIONS

	2030 With Project (Proposed GPA Option 2)				**2030 With Project (Alternative GPA)**			
	AM Peak Hour		**PM Peak Hour**		**AM Peak Hour**		**PM Peak Hour**	
Location	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
18. I-405 SB Ramps & Center	31.3	C	45.8	D	31.3	C	45.9	D
19. Beach & Center	20.0	B	21.6	C	19.9	B	21.4	C
28. Beach & Edinger	61.9	E	68.0	E	61.6	E	67.3	E
37. Beach & Heil	21.6	C	36.3	D	21.6	C	35.9	D
47. Beach & Warner	38.0	D	62.4	E	38.0	D	62.1	E
250. Beach & McFadden	41.1	D	55.1	E	40.6	D	54.3	D
251. Beach & Bolsa	54.2	D	97.8	F	53.9	D	96.9	F
252. Beach & Hazard	30.4	C	36.0	D	31.0	C	35.8	D

The proposed mitigation is to participate in future improvements to this intersection on a fair share basis. Two potential improvements are as follows:

1. Add third westbound through lane
2. Add fourth northbound through lane

Additionally, the eastbound on-ramp to the I-405 east of the intersection would be widened to two lanes, and entry allowed from two of the eastbound lanes (one would be a dedicated lane for the on-ramp and the other an optional lane). The purpose of this improvement is to alleviate the existing operational problem discussed in the existing conditions section of this report whereby eastbound Edinger Avenue traffic at the Beach Boulevard intersection has a high utilization of the curb lane.

For the 2014 impact, either of the two potential improvements noted earlier are adequate to achieve an acceptable LOS. The 2014 PM peak hour ICU values with these mitigation measures are as follows:

	2014 ICUs (PM Peak Hour)			
	1. Third WB Through Lane		**2. Fourth NB Through Lane**	
	GPA	**Alternative GPA**	**GPA**	**Alternative GPA**
Without Mitigation	.95	.94	.95	.94
With Mitigation	.89	.88	.88	.88

Hence, the cumulative impacts (including the project impacts) are mitigated with either of the proposed improvements.

To achieve an acceptable LOS under 2030 conditions, both of the proposed improvements are needed (although only one is needed to mitigate the project impacts). The resulting 2030 ICU values are as follows:

	2030 ICUs (PM Peak Hour)	
	GPA	**Alternative GPA**
Without Mitigation	1.05	1.05
With Mitigation	.86	.85

Hence, the intersection will operate at LOS “D” with the proposed mitigation (the same LOS is obtained using the HCM delay methodology).

Since both the short-range and long-range impacts are cumulative (that is, the project contributes to but does not cause the deficiency), the project mitigation measure is to participate in the improvements on a fair share basis. The project fair share has been calculated by examining the 2014 and 2030 ICUs in relation to mitigating to an acceptable level of service. The ICU reduction from the mitigation measure is calculated and then the project ICU as a proportion of that reduction (or the portion needed to reach LOS D) is estimated. The project share results for 2014 are as follows:

	1. Third WB Through Lane		**2. Fourth NB Through Lane**	
	Proposed GPA	**Alternative GPA**	**Proposed GPA**	**Alternative GPA**
ICU Without Mitigation	.95	.94	.95	.94
Difference from .90	.05	.04	.05	.04
Project ICU	.019	.013	.019	.013
Project Share	38%	33%	38%	33%

Hence, the proposed GPA project would pay 38 percent of one of the mitigation measures, and the corresponding share for the Alternative GPA would be 33 percent.

Since the project contributes to the long-range deficiencies at this location, project shares with respect to mitigation (both mitigation measures in this case) would be as follows:

	Proposed GPA	**Alternative GPA**
ICU Without Mitigation	1.05	1.05
Difference from .90	.15	.15
Project ICU	.019	.013
Project Share	13%	9%

Hence, under this calculation, the Proposed GPA project would contribute 13 percent to the combined mitigation measures and the corresponding share for the Alternative GPA would be nine percent.

Since at least one of the mitigation measures is needed to accommodate project traffic in 2014, implementation of one of the improvements should be pursued within that time frame with the project contributions as noted in the above 2014 calculation.

Chapter 5.0
OTHER ITEMS

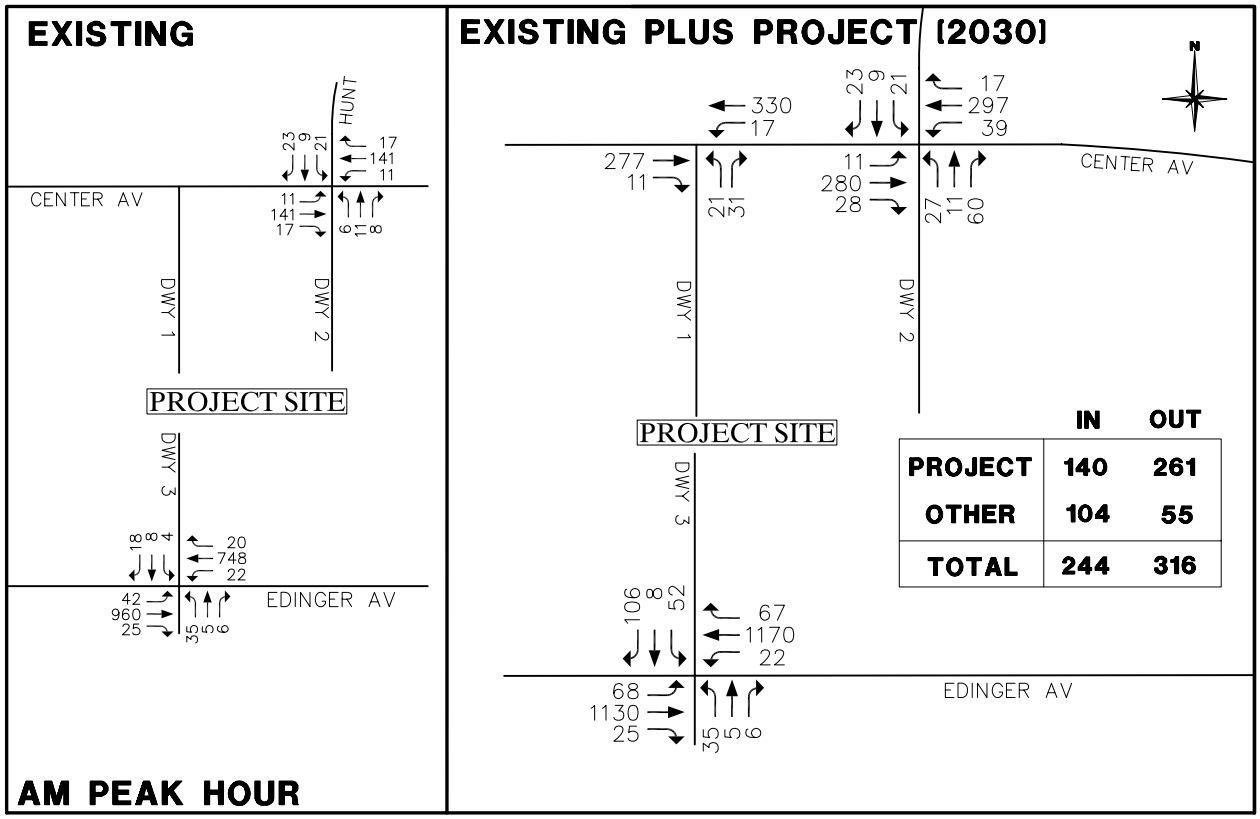
This chapter discusses related traffic items such as project access, transit, impacts to the regional freeway system, and Congestion Management Program (CMP) intersections.

PROJECT ACCESS

A preliminary site layout representing both the Proposed General Plan Amendment (GPA) and the Alternative GPA project was presented in Chapter 3.0. This shows four project access points, three of which are at existing intersections with two of those currently signalized. The signalized intersection on Center Avenue (opposite Huntington Village Lane) is one of several access points serving existing Bella Terra traffic. It is located immediately northeast of The Village at Bella Terra, and will serve the proposed project as well as continue to serve existing traffic. The non-signalized location to the west on Center Avenue is a Tee-intersection but with minimal existing traffic volumes.

The project will have two access points on Edinger Avenue. The easterly access (currently signalized) also serves some existing Bella Terra traffic and provides access to a shopping center on the south side of Edinger Avenue. The second is adjacent to the railroad and would be right-in/right-out only since there is no median break for left turns in or out. The site plan shows this as more of an alleyway than a major access road, and hence all the Edinger Avenue traffic was loaded onto the signalized access point to give a worst case as far as capacity needs are concerned.

Figure 5-1 shows the long-range (2030) peak hour volumes for the three access points for the GPA project. The corresponding Alternative GPA volumes are given in Figure 5-2. At the two signalized intersections, the project volumes have been added to the existing volumes to give the total traffic entering and exiting. It should be noted that these driveway volumes do not include the discount for pass-by trips described in the trip generation section of Chapter 3.0, but do account for internal capture. Allocation of trips to the project driveways generally assumes that vehicles will take the shortest path to and from the on-site uses that generate those trips. Some refinement of this allocation may occur when on-site parking and circulation is finalized.



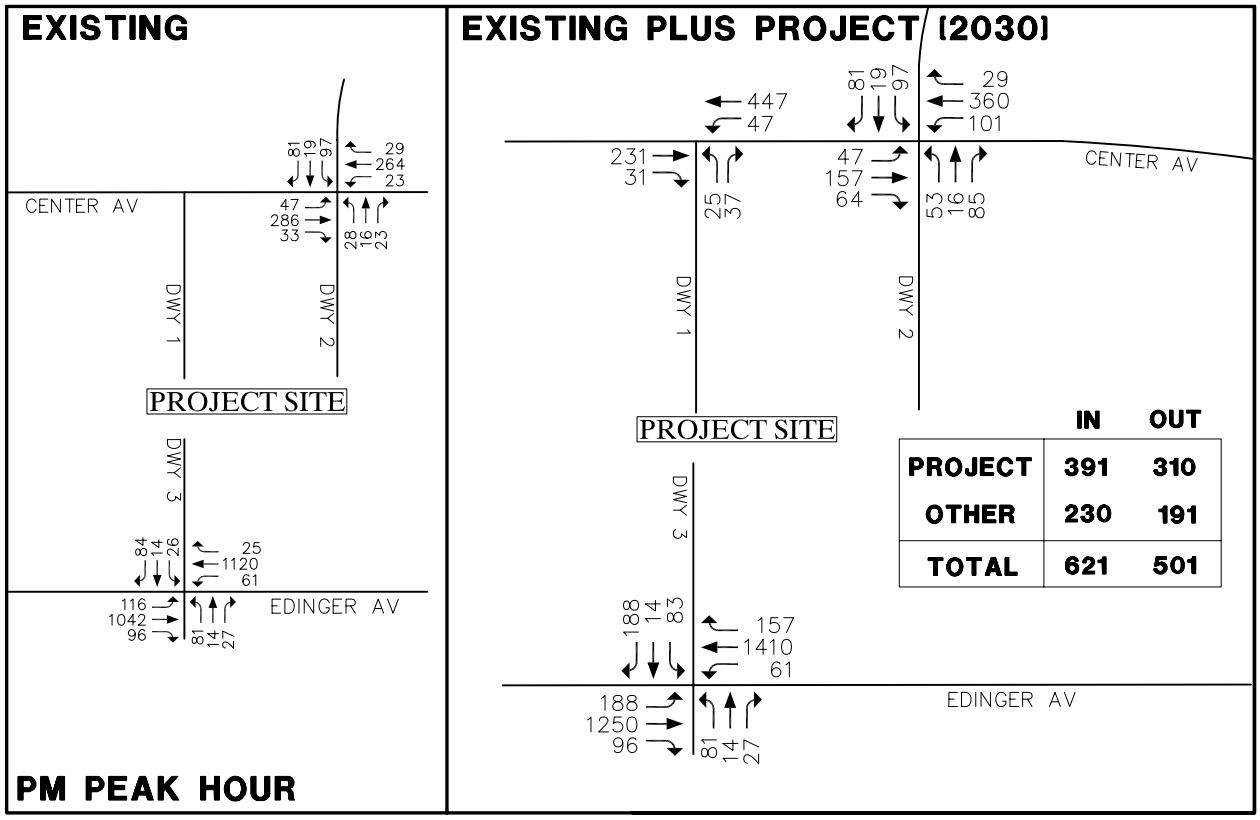


Figure 5-1

YEAR 2030 PEAK HOUR DRIVEWAY VOLUMES
- PROPOSED GPA OPTION 2

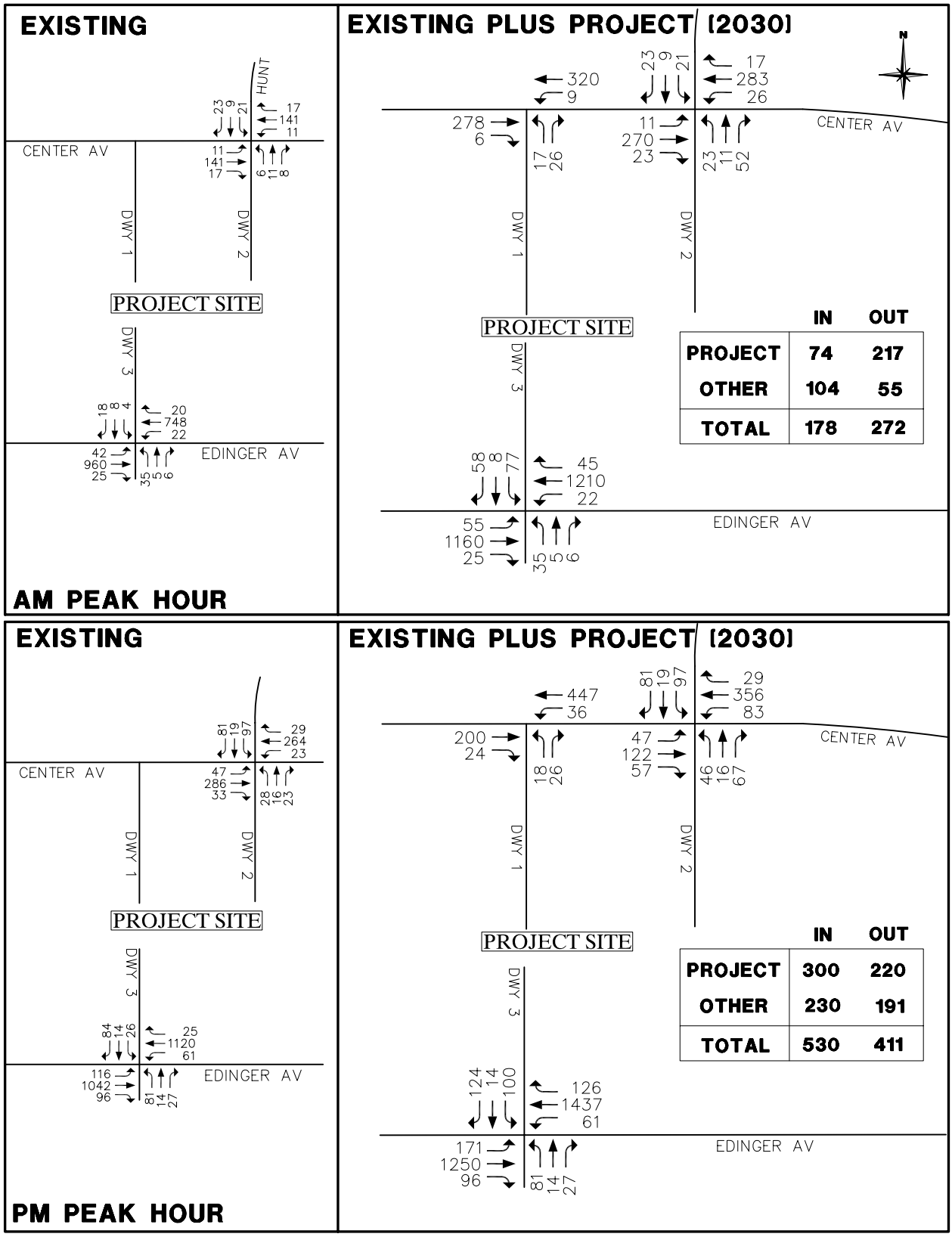


Figure 5-2

YEAR 2030 PEAK HOUR DRIVEWAY VOLUMES
- ALTERNATIVE GPA

Levels of services for the three access points were calculated using the Highway Capacity Manual (HCM) methodology for the unsignalized intersection and the intersection capacity utilization (ICU) methodology for the two signalized intersections. The results are summarized in Table 5-1 and actual ICU calculations can be found in the last section of Appendix A. As can be seen, all three of the project access intersections are shown to operate at acceptable levels of service. Because of the close spacing between the two access intersections on Center Avenue, the unsignalized intersection is not proposed to be signalized. The existing Tee-intersection configuration at that location will remain, providing full access in all directions.

Lane configurations for the three driveways can be seen in Figure 5-3. Also shown here for reference purposes are the lane configurations for the two existing access points for Bella Terra at Sher Lane and Parkside Lane. While these are not anticipated to be used for access to The Village at Bella Terra, project traffic on Edinger Avenue will use these intersections. Hence, the with-project ICUs for 2030 were calculated for these two locations (see last section of Appendix B for actual ICU calculations) and are as follows:

	Proposed GPA		**Alternative GPA**	
	AM Peak Hour	**PM Peak Hour**	**AM Peak Hour**	**PM Peak Hour**
Sher Lane/Edinger Ave	.40	.61	.40	.61
Parkside Lane/Edinger Ave	.36	.63	.36	.63

Hence, each intersection has adequate capacity for the 2030 volumes.

TRANSIT

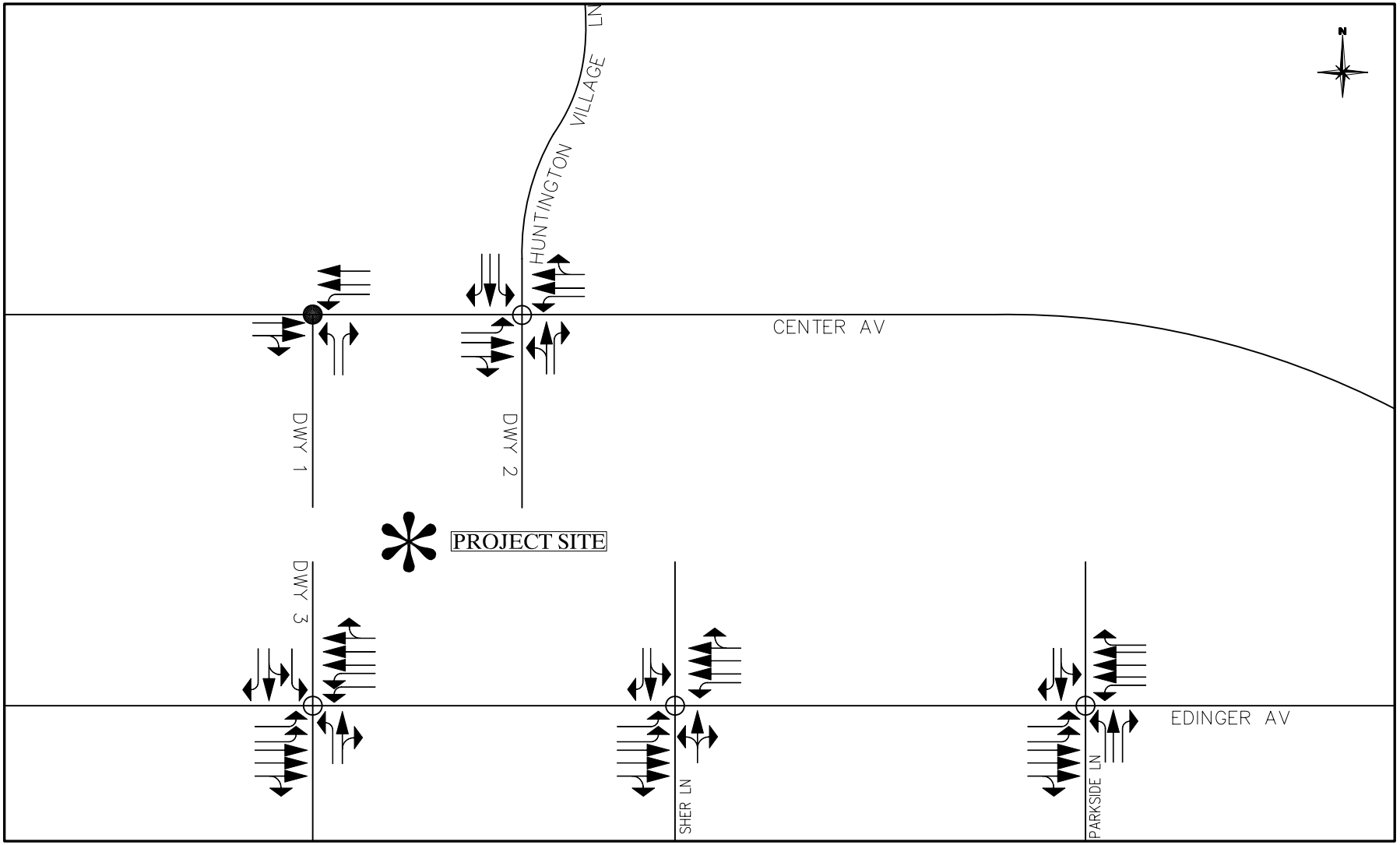
The trip generation reductions noted in Chapter 3.0 were largely for walk trips to and from both the residential and commercial uses within the project. They also account for trips by other non-private vehicle modes such as bicycle and transit. The Orange County Transportation Authority (OCTA) transit center immediately north of the project provides a convenient location for residential trips to be made by transit. While no specific estimate has been made of such usage, the project trip generation presented here may overestimate the actual trip generation if a significant amount of transit ridership occurs.

The railroad line adjacent to the project currently serves goods movement on an irregular basis. While interest has been expressed in future potential transit uses, no current plans have been formulated, and no studies are currently being carried out to assess the feasibility of this type of use.

Table 5-1

PROJECT DRIVEWAY LEVELS OF SERVICE

	GPA Option 2				Alternative GPA			
Signalized Intersections								
	AM Peak Hour		**PM Peak Hour**		**AM Peak Hour**		**PM Peak Hour**	
Location	**ICU**	**LOS**	**ICU**	**LOS**	**ICU**	**LOS**	**ICU**	**LOS**
Center Ave	.18	A	.28	A	.18	A	.27	A
Edinger Ave	.39	A	.57	A	.39	A	.54	A
Unsignalized Driveway								
	AM Peak Hour		**PM Peak Hour**		**AM Peak Hour**		**PM Peak Hour**	
Location	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
Center Ave	15.4	C	19.4	C	14.7	C	17.5	C



Legend

Signalized intersection
Unsignalized intersection

Figure 5-3

INTERSECTION LANE CONFIGURATIONS
- PROJECT ACCESS

REGIONAL FREEWAY SYSTEM

The freeway impact criteria typically used in Orange County for projects such as this is the Congestion Management Program (CMP) threshold of more then three percent. This has been used in absence of any criteria formally specified by Caltrans for State Highway facilities. Peak hour project traffic on the adjacent I-405 Freeway for 2030 is as follows:

		AM Peak Hour		
Location	**Direction**	**Total Volume**	**Project**	**(%)**
North of Goldenwest	AM NB	11,260	41	.36
North of Goldenwest	PM SB	11,430	55	.48
North of Beach	AM NB	11,620	35	.30
North of Beach	PM SB	11,770	47	.40
South of Beach	PM NB	12,940	52	.40
South of Beach	AM SB	12,740	38	.30

These selected locations have the highest amount of project traffic, and as can be seen do not meet the threshold of more then three percent.

An analysis was made of the Beach Boulevard collector-distributor (CD) roads, the freeway weave sections which carry some project traffic and the freeway mainline sections in the vicinity of the project. The analysis uses 2030 forecasts, and indicates the amount of project traffic where applicable. While 2014 information is not included in this analysis, the project contribution is the same for that year, and the 2030 time frame shows worst case conditions as far as freeway conditions are concerned. The results are given in Appendix D and can be summarized as follows:

2030 LEVEL OF SERVICE - FREEWAY								
	Southbound				**Northbound**			
	Mainline		**Weave Section**		**Mainline**		**Weave Section**	
Location	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Westminster								
	F (.16)	E(.48%)	F(.19)	F(.37%)	E(.36%)	F(.33%)	E(.60%)	F(.84%)
Goldenwest								
	F(.14)	E(.40%)	E(.81)	F(1.55%)	E(.30%)	F(.28%)	E(1.99%)	F(1.84%)
Beach								
	F(.30%)	F(.33%)	F(1.70%)	F(1.13)	F(.17)	F(.40)	F(.94)	F(2.25%)
Magnolia								
Note: Numbers in parenthesis show percent of project traffic.								

For the Beach Boulevard CD roads, the 2030 results are as follows:

	Southbound		Northbound	
	AM	**PM**	**AM**	**PM**
Volume/Capacity	.46	.87	1.31	1.53
Project V/C	.01	.01	.03	.05
Project Percent	1.8%	1.0%	2.3%	3.2%

A V/C greater than 1.00 represents a deficiency and hence the northbound CD road is deficient in the AM and PM.

From the freeway information presented here, it can be seen that the project contributes to future deficiencies on the freeway mainline and the weaving sections in the vicinity of the project. It also contributes to a future deficiency on the northbound CD road. Since there is no significance criteria for these facilities, each of these impacts is considered significant. Mitigation measures involve major regional improvements such as presented in the I-405 PSR/PDS (see discussion later in this chapter) and hence it is concluded that the impacts are significant and unavoidable.

CMP INTERSECTIONS

As shown in Chapter 3.0, the 2014 ICU values at the two CMP intersections in the study area are as follows:

	No-Project		GPA		Alternative GPA	
Intersection	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Beach Blvd & Edinger Ave	.73	.92	.74	.95	.74	.94
Beach Blvd & Warner Ave	.72	.92	.72	.92	.72	.92

Neither intersection shows ICU values that exceed the allowable CMP threshold of 1.00 and therefore there are no project CMP impacts.

RIPCURL PROJECT

The City of Huntington Beach is currently processing a development proposal for a mixed-use project on the southeast corner of Gothard Street and Center Avenue. It will replace an existing commercial center with a mix of residential and commercial uses.

Trip generation comparisons carried out for the current General Plan and for the Ripcurl GPA indicate that the project will add around 1,700 daily trips to the street network in the immediate vicinity. This causes a significant impact to the intersection of the I-405 southbound ramps and Center Avenue for the 2030 PM peak hour and a mitigation measure was identified accordingly.

The analysis of this intersection for the proposed Bella Terra GPA and the Alternative GPA shows a slight reduction in trips at this intersection (compared to the current General Plan). This reduction is sufficient to eliminate the impact caused by the Ripcurl GPA. Hence, as far as The Village at Bella Terra is concerned, there are no project impacts at this intersection.

I-405 CORRIDOR STUDY

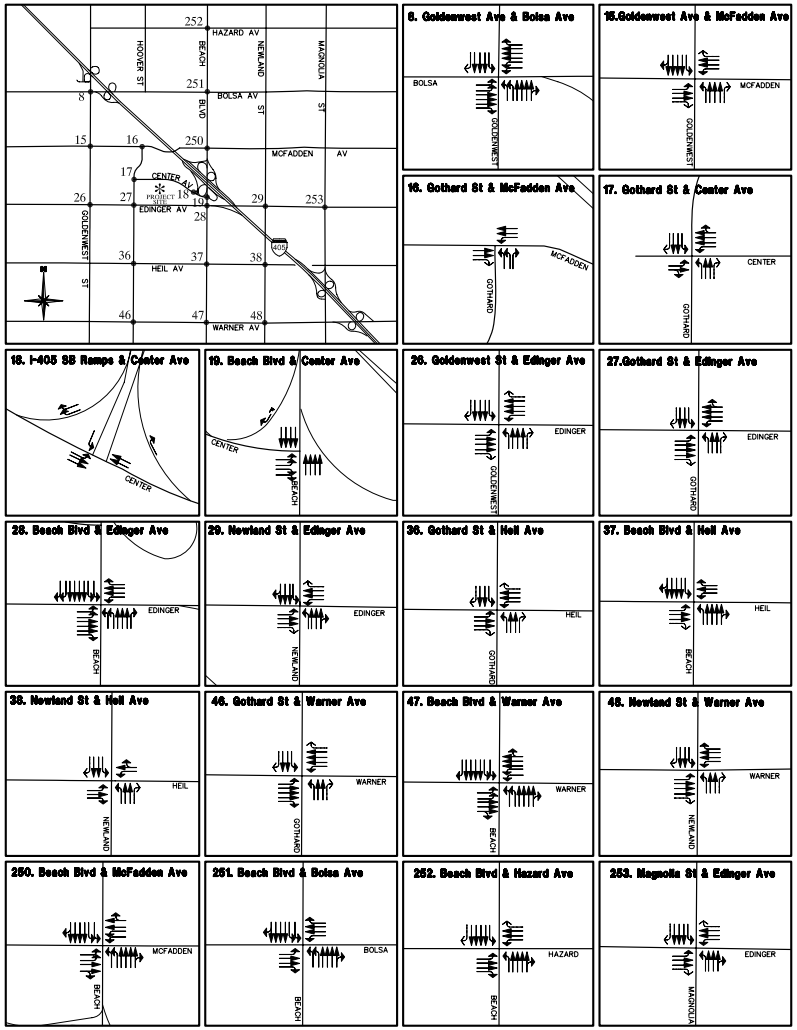
A Project Study Report/Project Development Support (PSR/PDS) for the I-405 Freeway through the City of Huntington Beach and adjacent communities is nearing completion. Improvements being recommended in the study include widening of the freeway, changes to the Beach Boulevard and Goldenwest Street interchange configurations, and buildout to full MPAH standards of all roadway crossings of the freeway (in the study area this will result in the McFadden Avenue overcrossing being widened to four lanes). An upcoming study to prepare a Project Report and Environmental Document (PR/ED) will define the improvements in greater detail and identify potential environmental impacts (this is scheduled to commence in late 2008 and to be completed by 2011).

For the purpose of defining the committed improvements used in this analysis, widening of I-405 by one lane in each direction has been assumed. This is consistent with projects included in the recent Measure M renewal. The improvements to the interchanges, together with the McFadden Avenue overcrossing widening, were not assumed as being committed since funding is not assured at this time. Hence, with respect to these improvements, the traffic study assumes a worst case baseline for CEQA purposes.

Appendix A

INTERSECTION DATA

A-1 Existing Lane Configurations
A-2 Existing AM Peak Hour Volumes
A-3 Existing PM Peak Hour Volumes
A-4 Committed Lane Configurations
A-5 AM Peak Hour Volumes – Project Only (GPA)
A-6 PM Peak Hour Volumes – Project Only (GPA)
A-7 AM Peak Hour Volumes – Project Only (Alternative GPA)
A-8 PM Peak Hour Volumes – Project Only (Alternative GPA)
A-9 2014 No-Project AM Peak Hour Volumes
A-10 2014 No-Project PM Peak Hour Volumes
A-11 2014 With-Project AM Peak Hour Volumes (GPA)
A-12 2014 With-Project PM Peak Hour Volumes (GPA)
A-13 2014 With-Project AM Peak Hour Volumes (Alternative GPA)
A-14 2014 With-Project PM Peak Hour Volumes (Alternative GPA)
A-15 2030 General Plan AM Peak Hour Volumes
A-16 2030 General Plan PM Peak Hour Volumes
A-17 AM Peak Hour Project Difference Volumes – GP Versus GPA
A-18 PM Peak Hour Project Difference Volumes – GP Versus GPA
A-19 AM Peak Hour Project Difference Volumes – GP Versus Alternative GPA
A-20 PM Peak Hour Project Difference Volumes – GP Versus Alternative GPA
A-21 2030 With-Project AM Peak Hour Volumes (GPA)
A-22 2030 With-Project PM Peak Hour Volumes (GPA)
A-23 2030 With-Project AM Peak Hour Volumes (Alternative GPA)
A-24 2030 With-Project PM Peak Hour Volumes (Alternative GPA)



Legend

- Existing Lane
- Right Turn Overlap
- De-facto Right-Turn Lane
- Free Right-Turn Lane

Figure A-1

EXISTING LANE CONFIGURATIONS

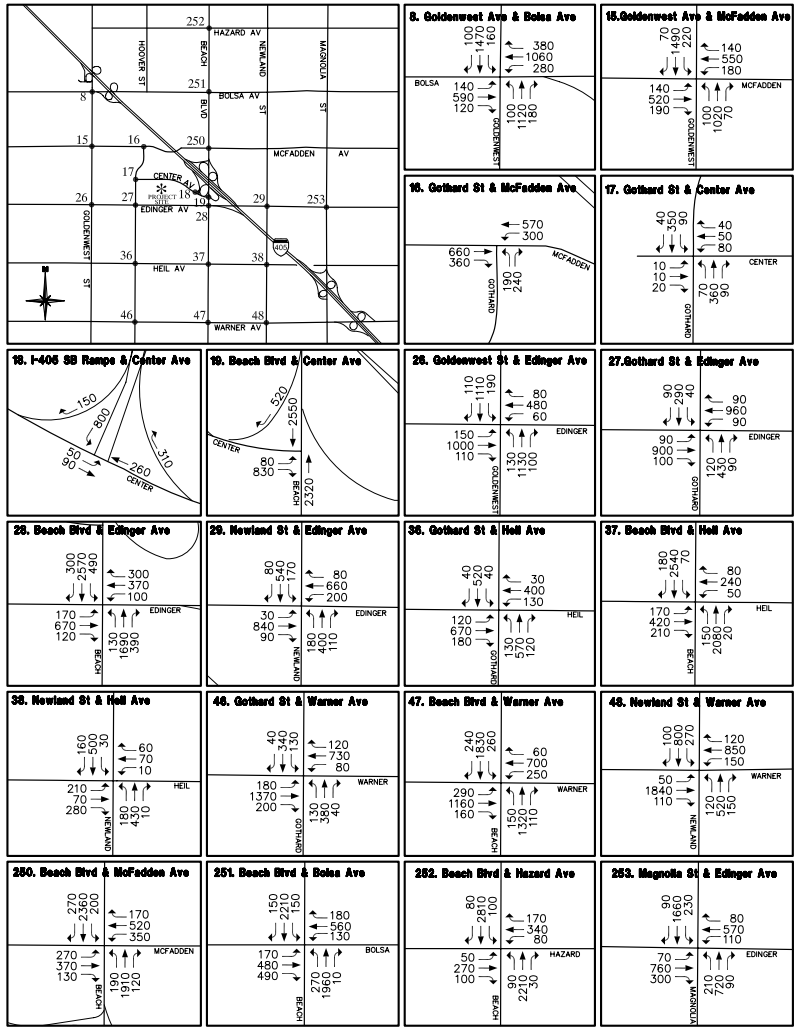


Figure A-2

EXISTING AM PEAK HOUR VOLUMES

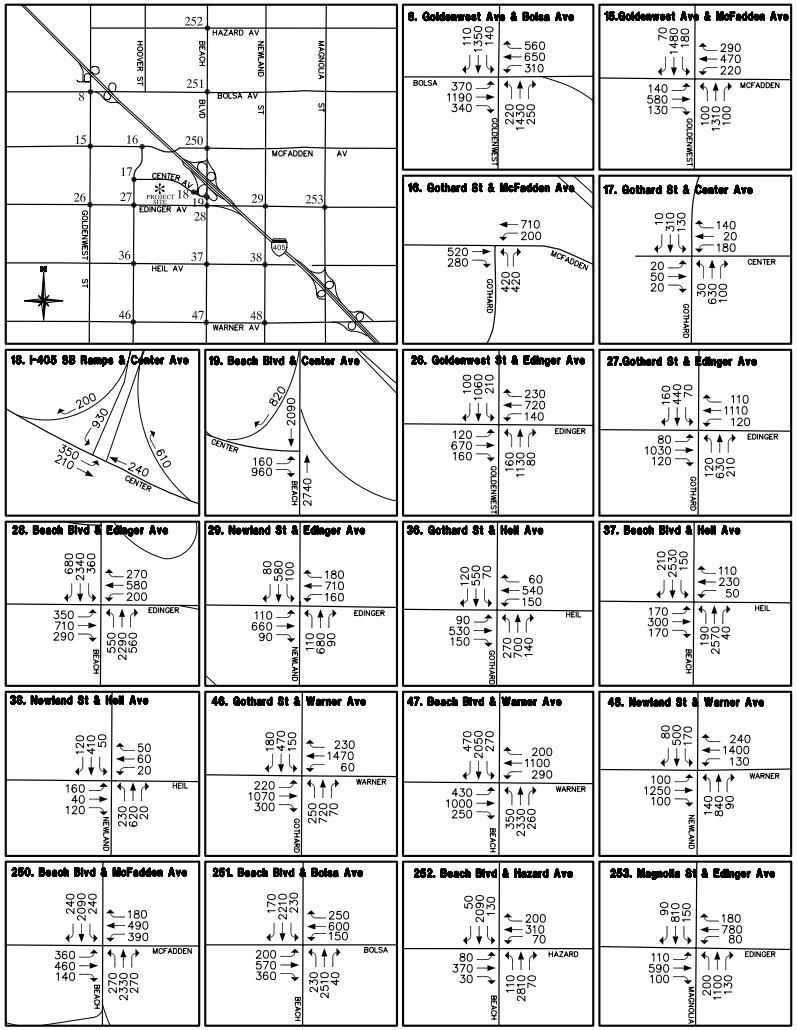
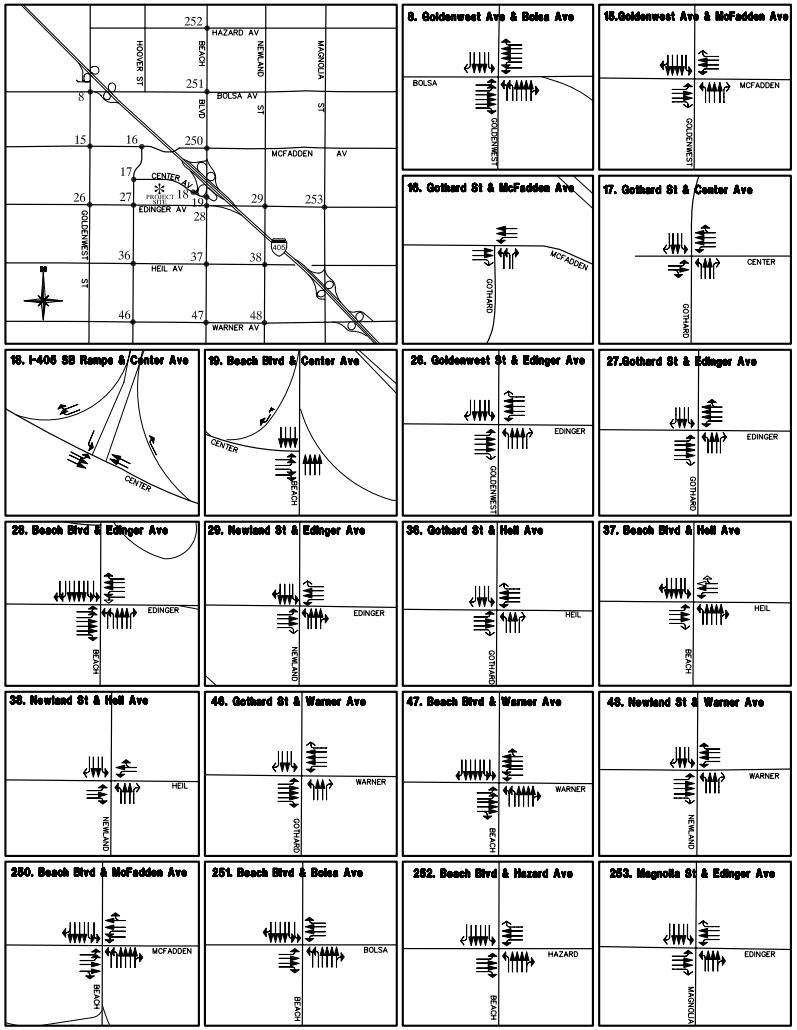


Figure A-3

EXISTING PM PEAK HOUR VOLUMES



Legend

- Existing Lane
- Future Lane
- Right Turn Overlap
- De-facto Right-Turn Lane
- Free Right-Turn Lane

Figure A-4

COMMITTED LANE CONFIGURATIONS

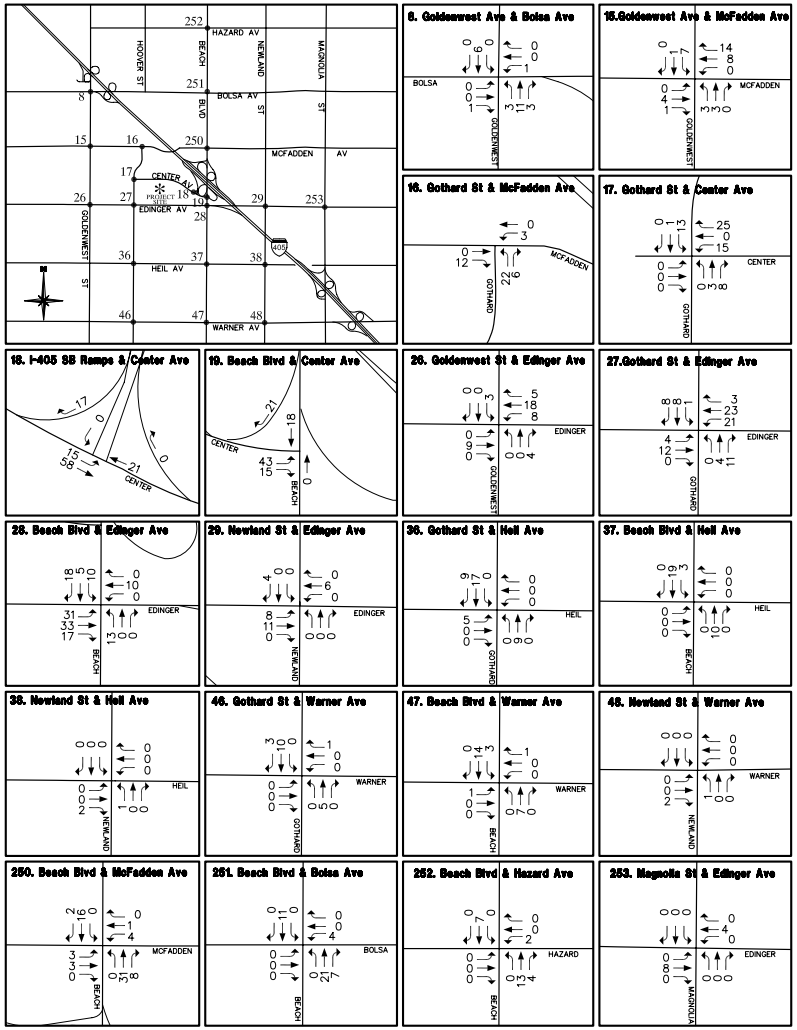


Figure A-5

AM PEAK HOUR VOLUMES
- PROJECT-ONLY
- PROPOSED GPA OPTION 2

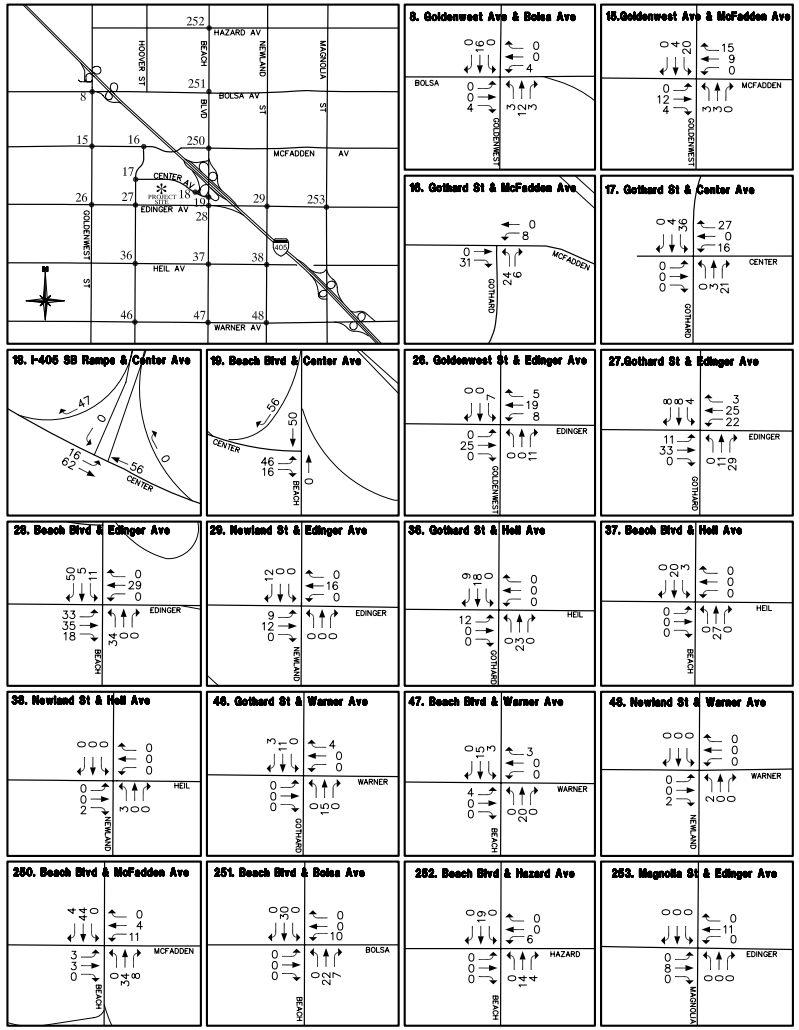


Figure A-6

PM PEAK HOUR VOLUMES
- PROJECT-ONLY
- PROPOSED GPA OPTION 2

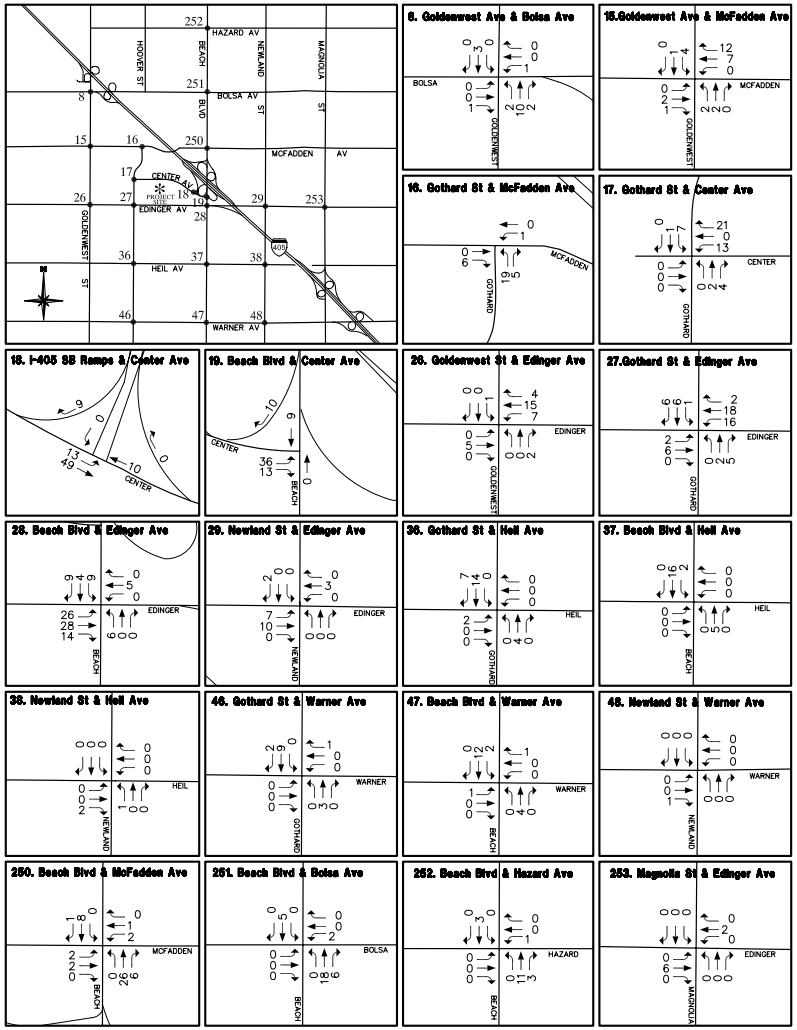


Figure A-7

AM PEAK HOUR VOLUMES
- PROJECT-ONLY
- ALTERNATIVE GPA

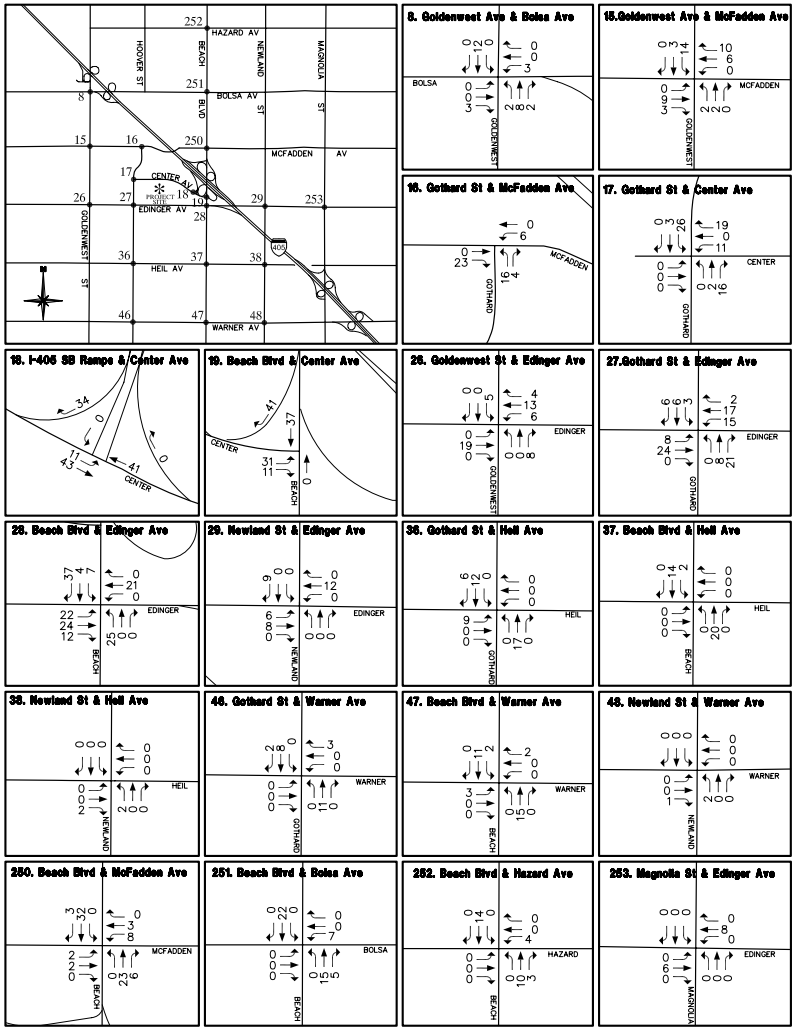


Figure A-8

PM PEAK HOUR VOLUMES
- PROJECT-ONLY
- ALTERNATIVE GPA

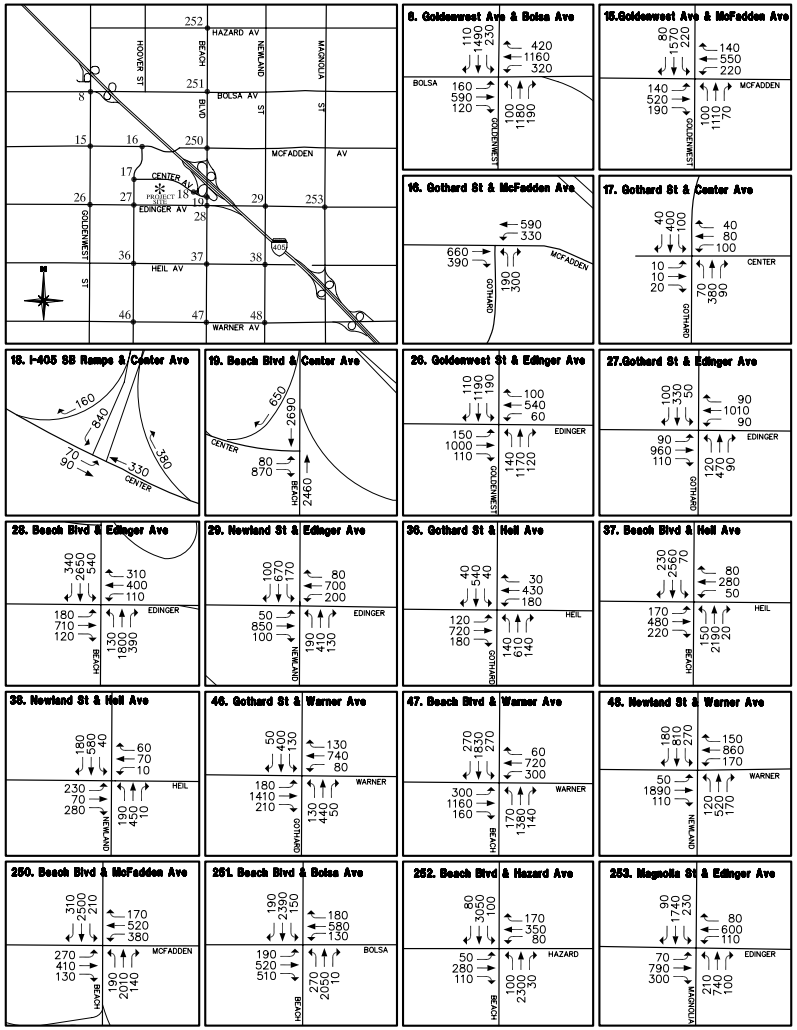


Figure A-9

YEAR 2014 AM PEAK HOUR VOLUMES
- NO-PROJECT

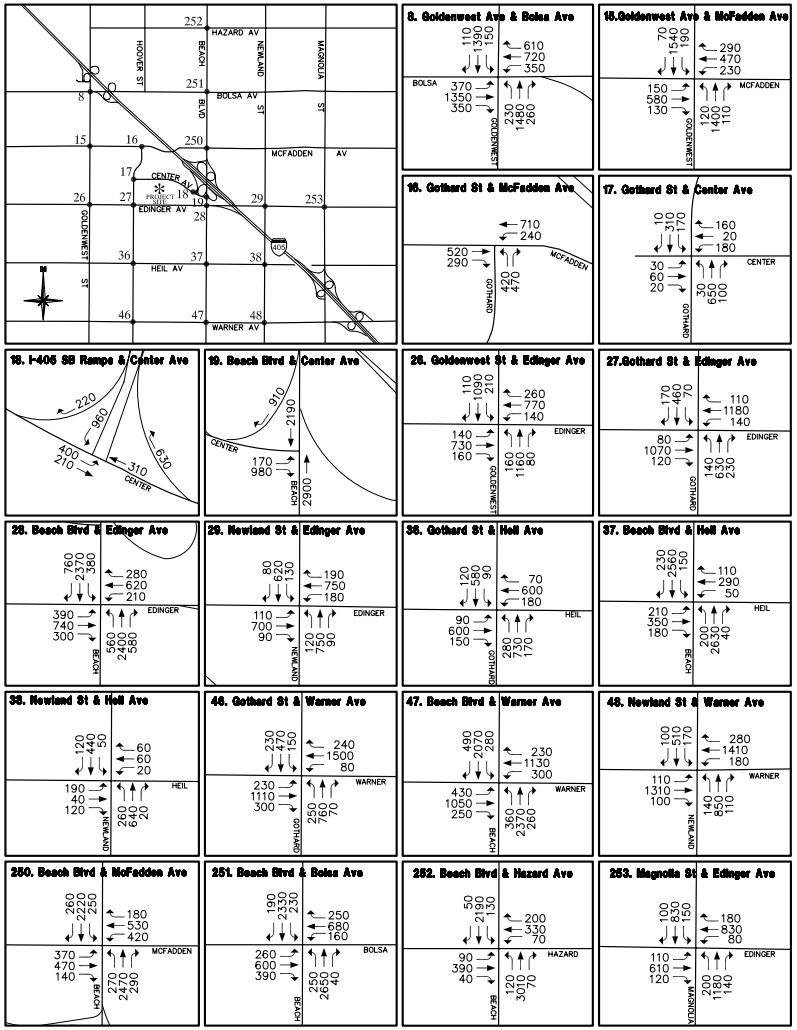


Figure A-10

YEAR 2014 PM PEAK HOUR VOLUMES
- NO-PROJECT

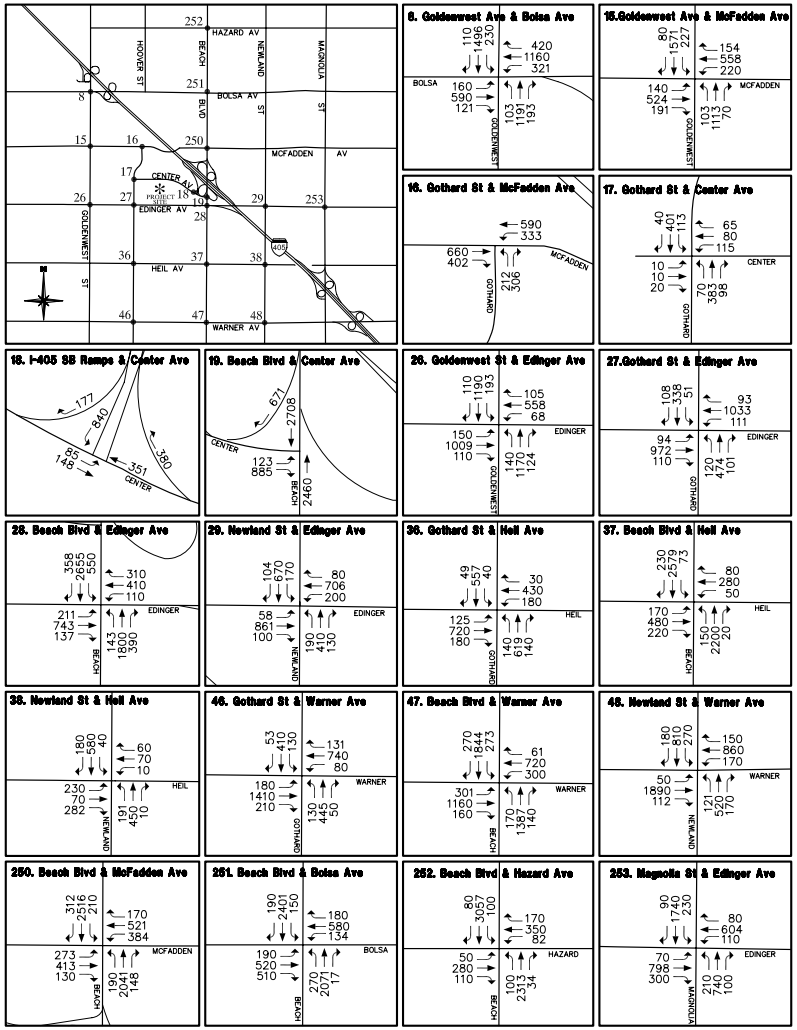


Figure A-11

YEAR 2014 AM PEAK HOUR VOLUMES
- WITH-PROJECT
- PROPOSED GPA OPTION 2

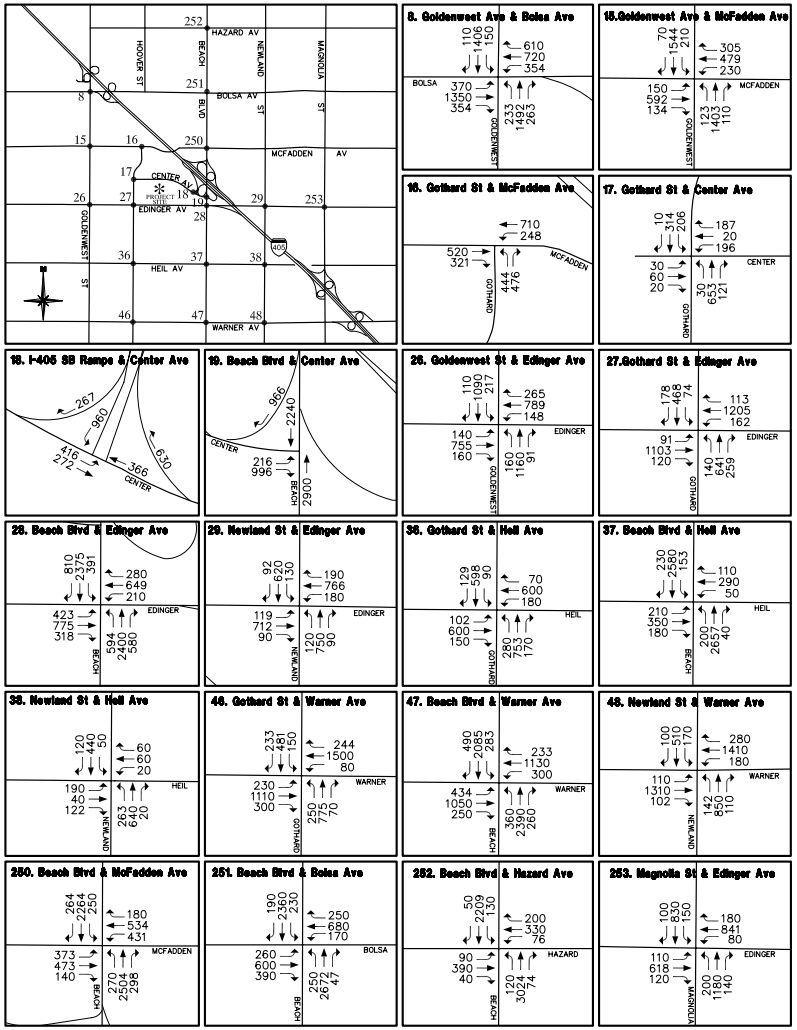


Figure A-12

YEAR 2014 PM PEAK HOUR VOLUMES
- WITH-PROJECT
- PROPOSED GPA OPTION 2

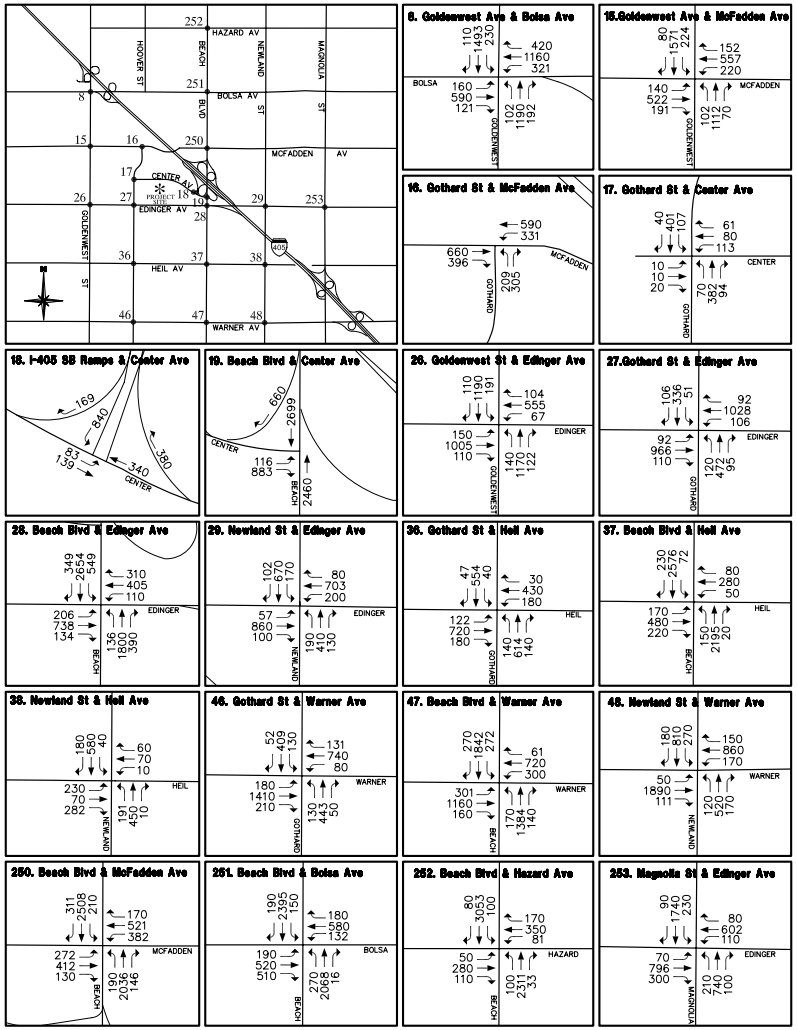


Figure A-13

YEAR 2014 AM PEAK HOUR VOLUMES
- WITH-PROJECT
- ALTERNATIVE GPA

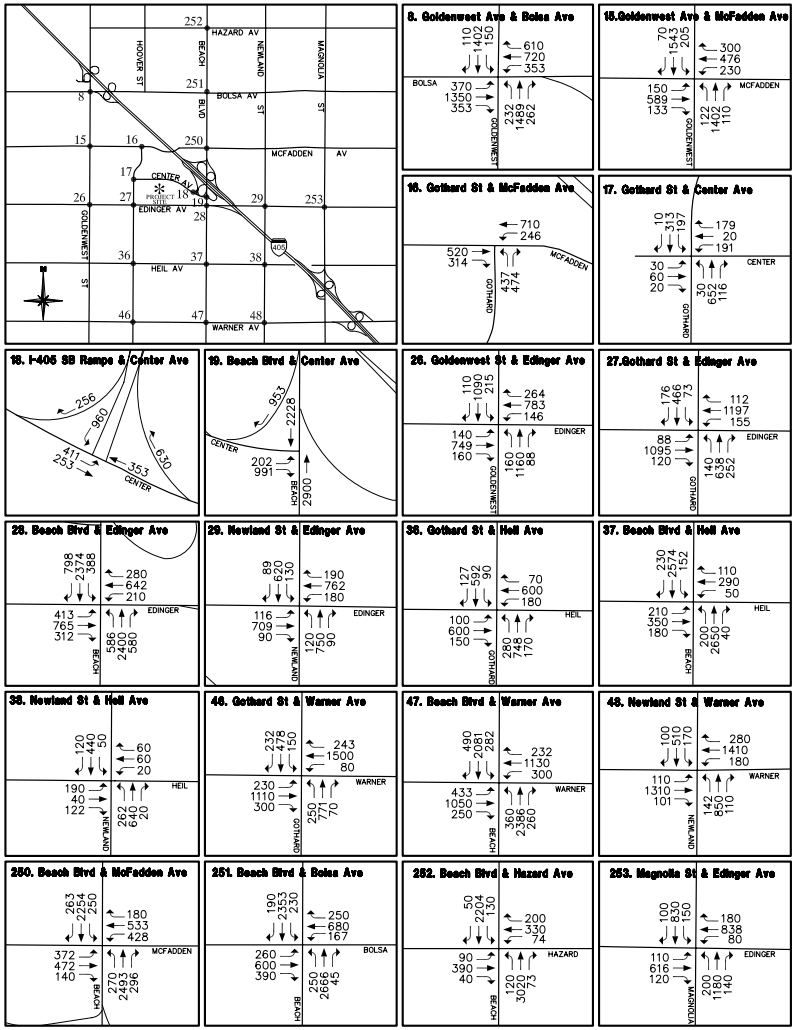


Figure A-14

YEAR 2014 PM PEAK HOUR VOLUMES
- WITH-PROJECT
- ALTERNATIVE GPA

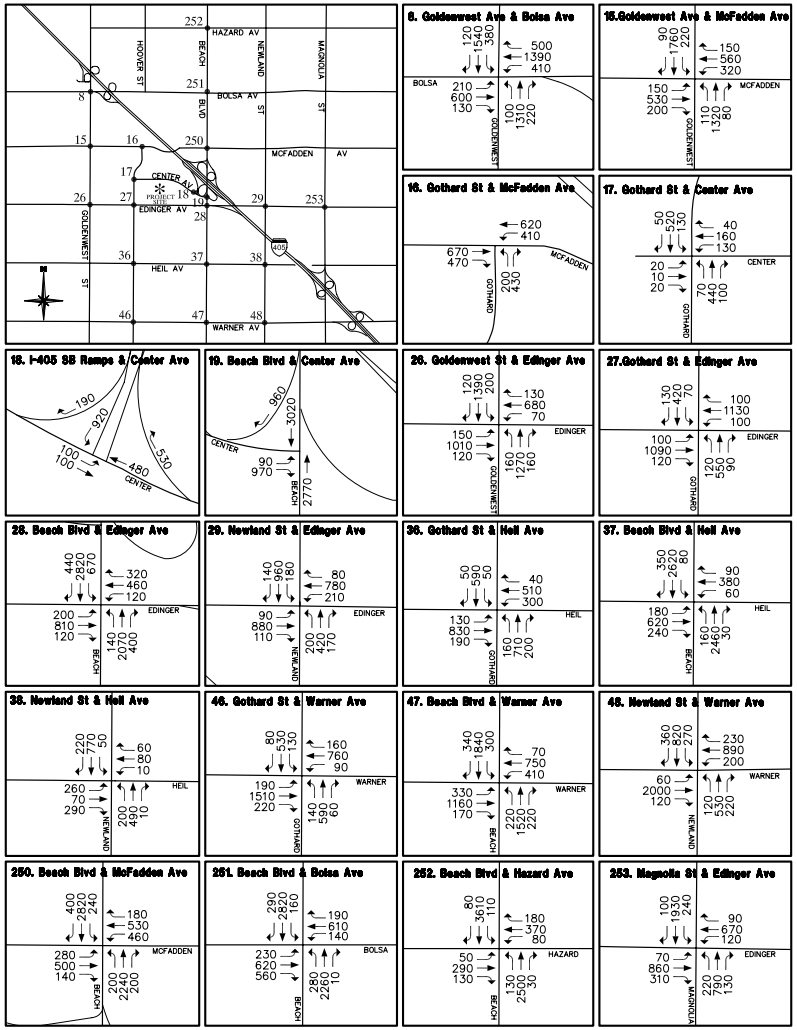


Figure A-15

YEAR 2030 AM PEAK HOUR VOLUMES
- GENERAL PLAN

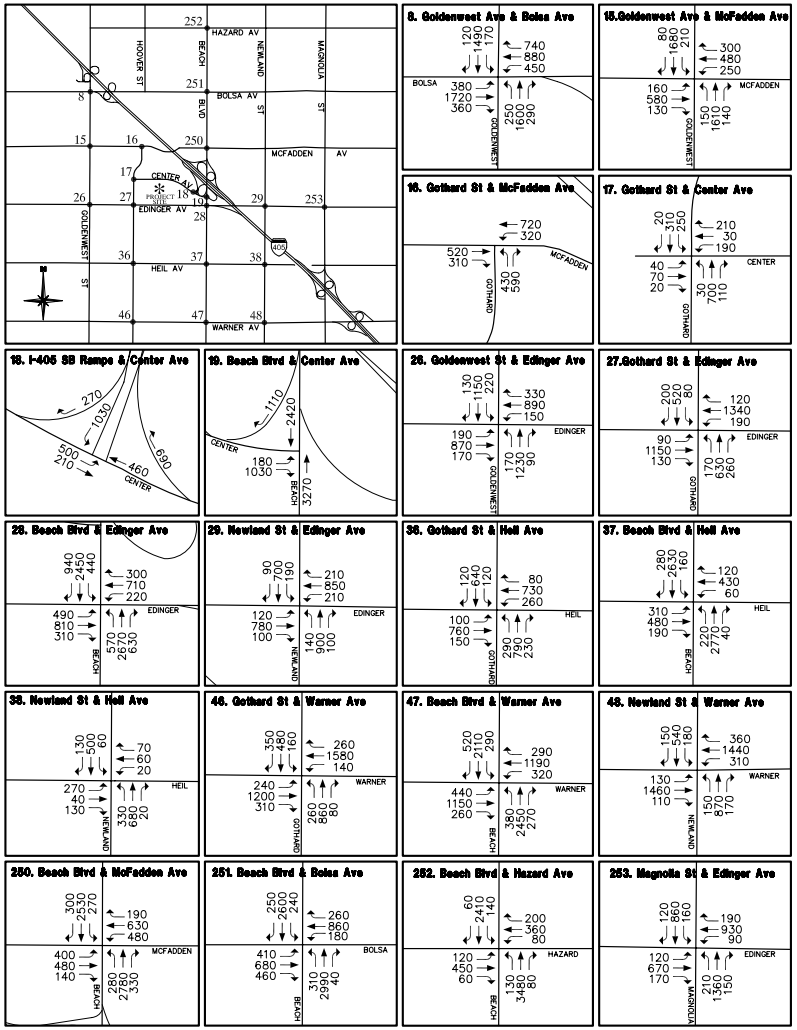


Figure A-16

YEAR 2030 PM PEAK HOUR VOLUMES
- GENERAL PLAN

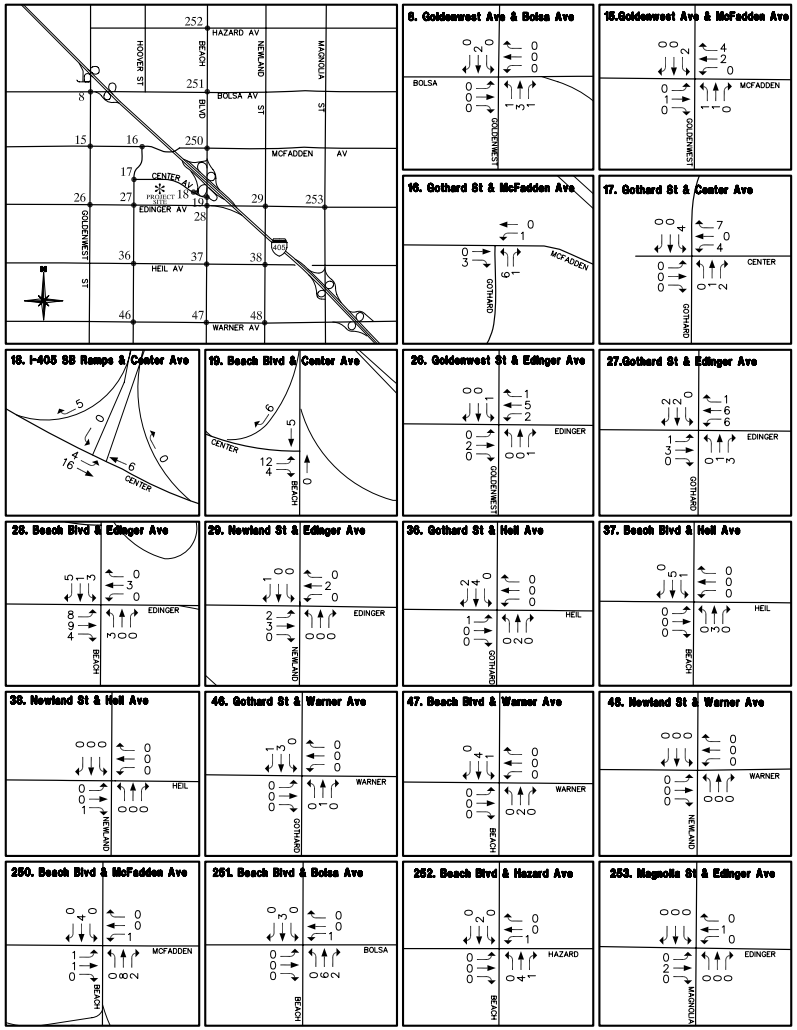


Figure A-17

AM PEAK HOUR PROJECT DIFFERENCE VOLUMES
- GENERAL PLAN VERSUS
PROPOSED GPA OPTION 2

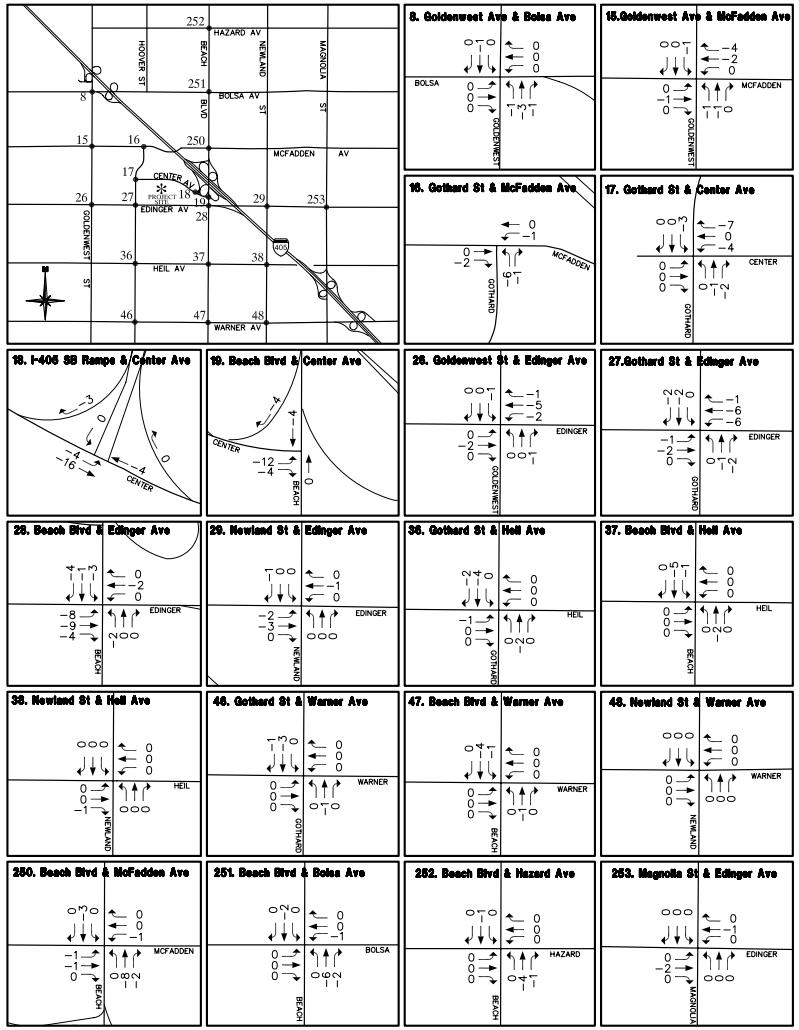


Figure A-18

PM PEAK HOUR PROJECT DIFFERENCE VOLUMES
- GENERAL PLAN VERSUS
PROPOSED GPA OPTION 2

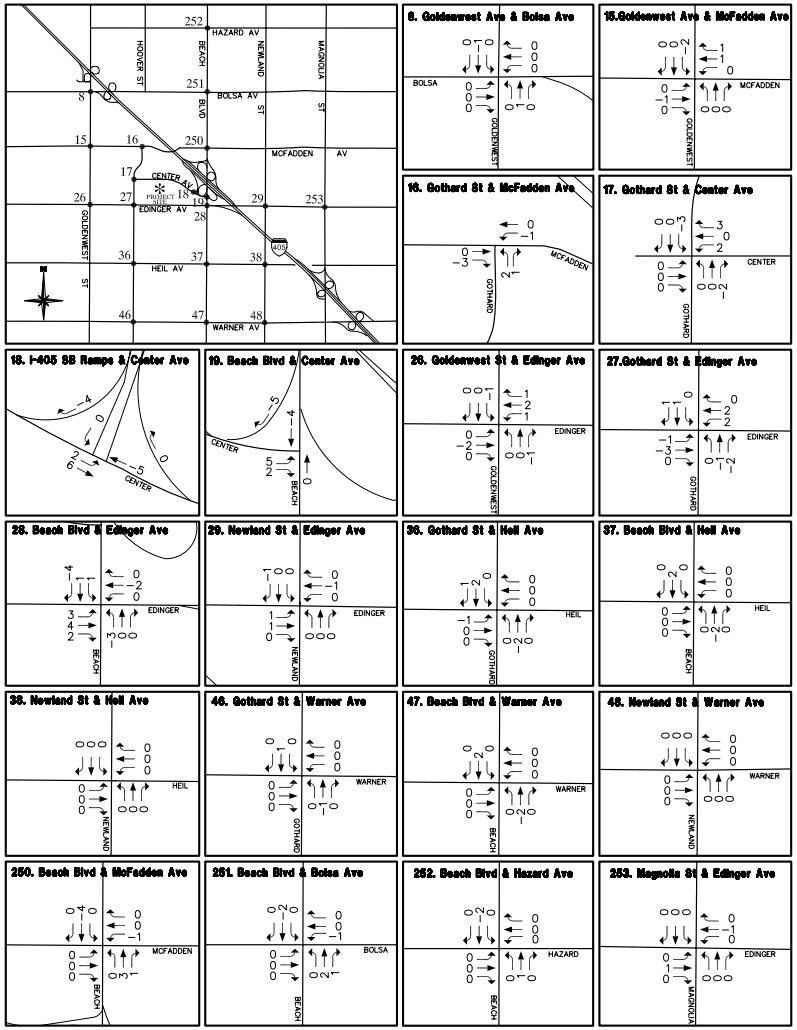


Figure A-19

AM PEAK HOUR PROJECT DIFFERENCE VOLUMES
- GENERAL PLAN VERSUS
ALTERNATIVE GPA

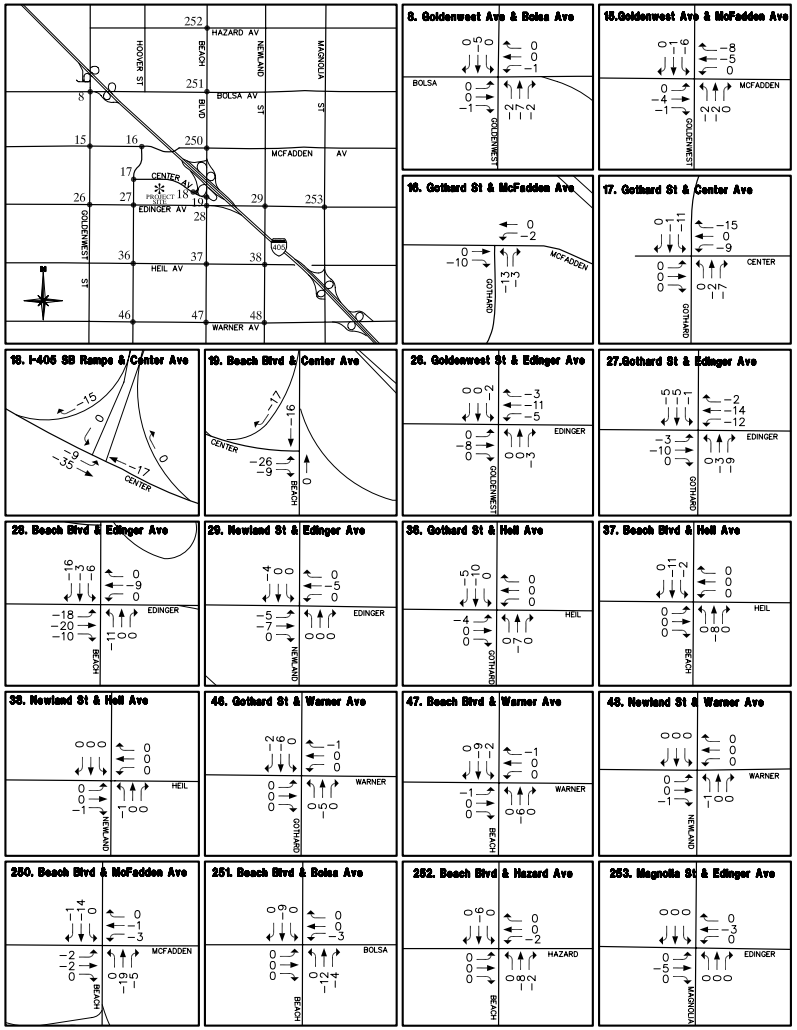


Figure A-20

PM PEAK HOUR PROJECT DIFFERENCE VOLUMES
- GENERAL PLAN VERSUS
ALTERNATIVE GPA

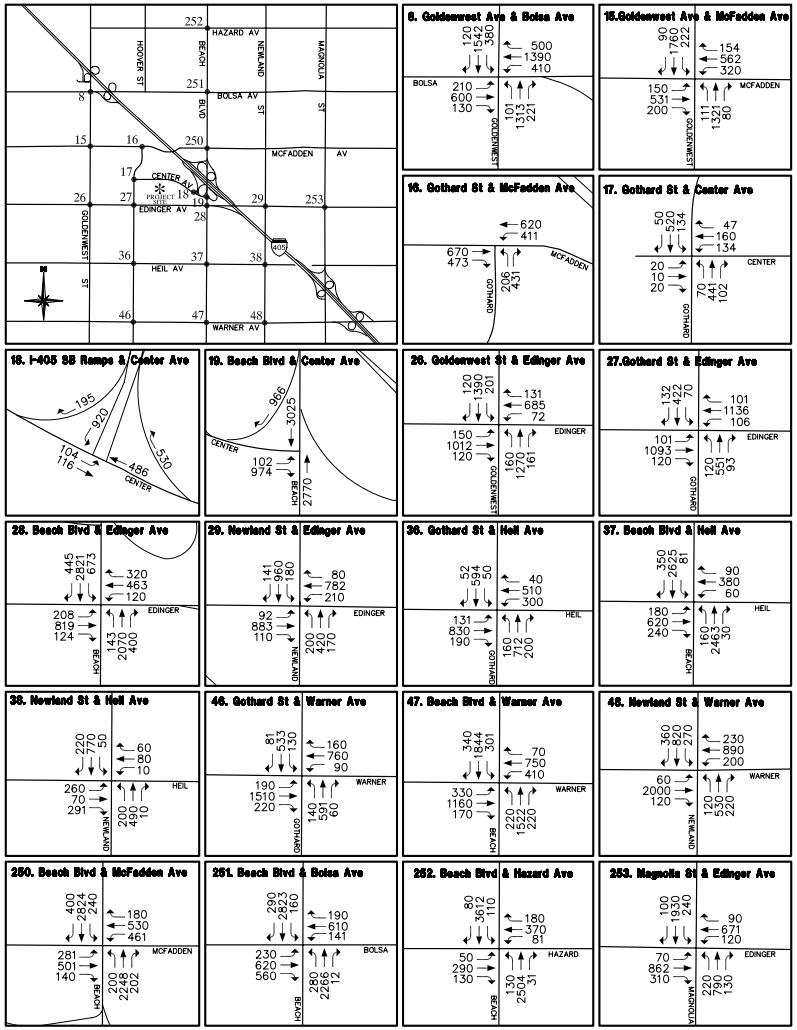


Figure A-21

YEAR 2030 AM PEAK HOUR VOLUMES
- WITH-PROJECT
- PROPOSED GPA OPTION 2

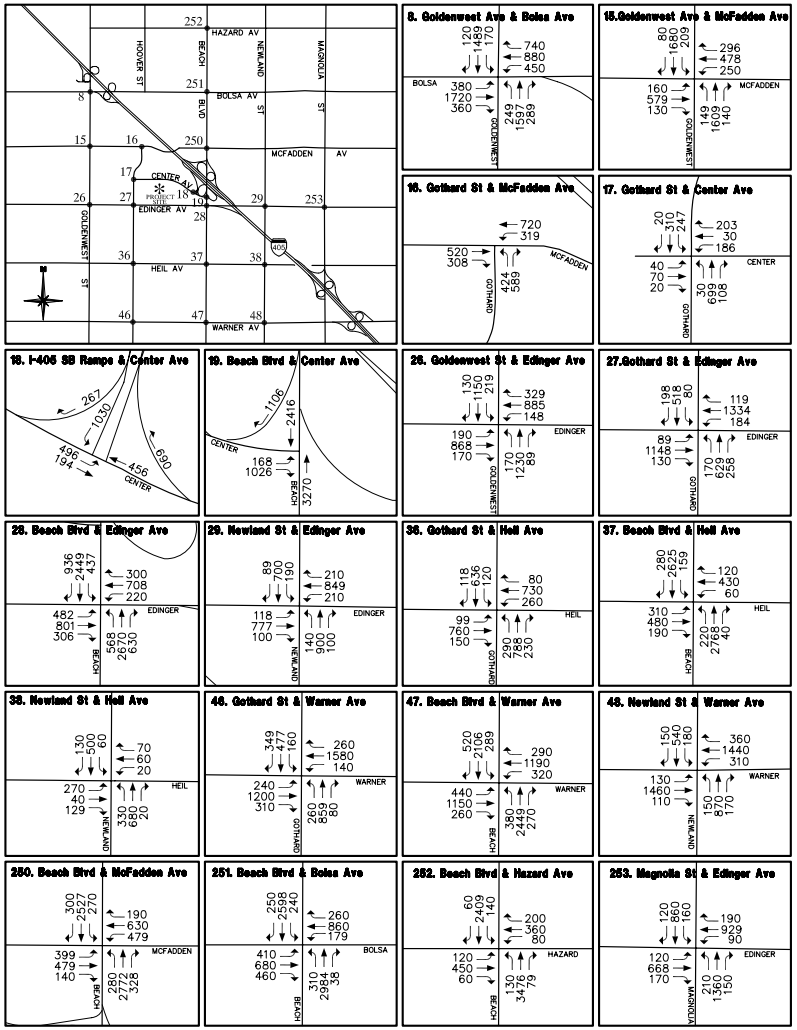


Figure A-22

YEAR 2030 PM PEAK HOUR VOLUMES
- WITH-PROJECT
- PROPOSED GPA OPTION 2

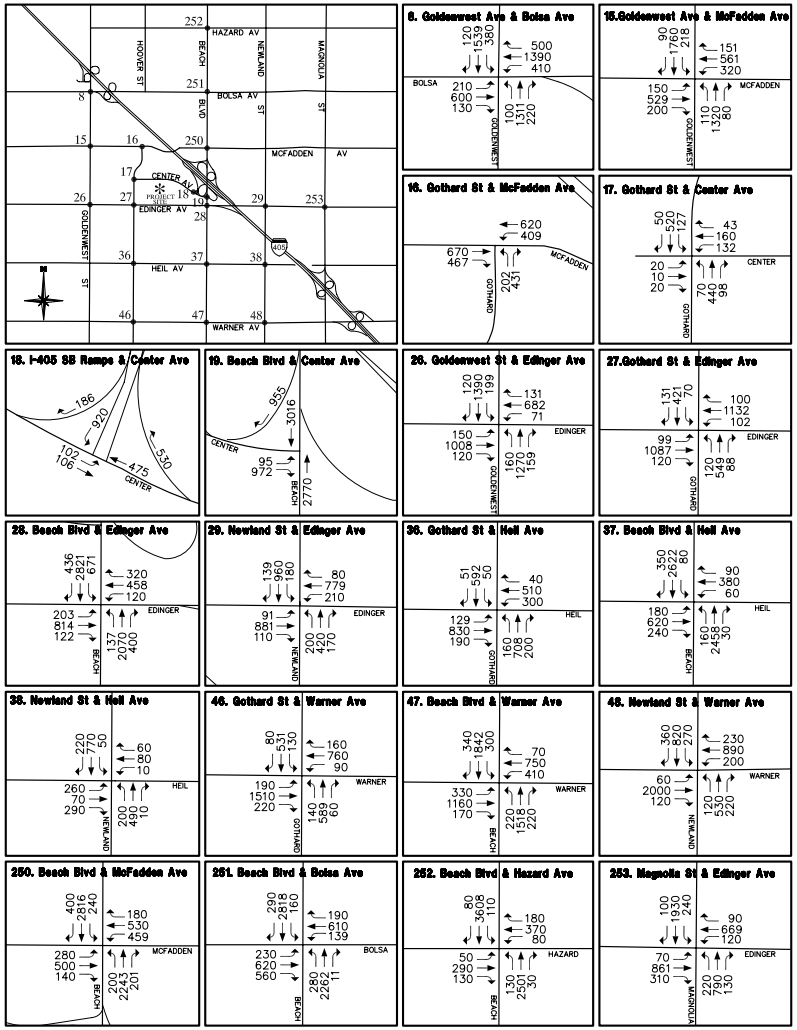


Figure A-23

YEAR 2030 AM PEAK HOUR VOLUMES
- WITH-PROJECT
- ALTERNATIVE GPA

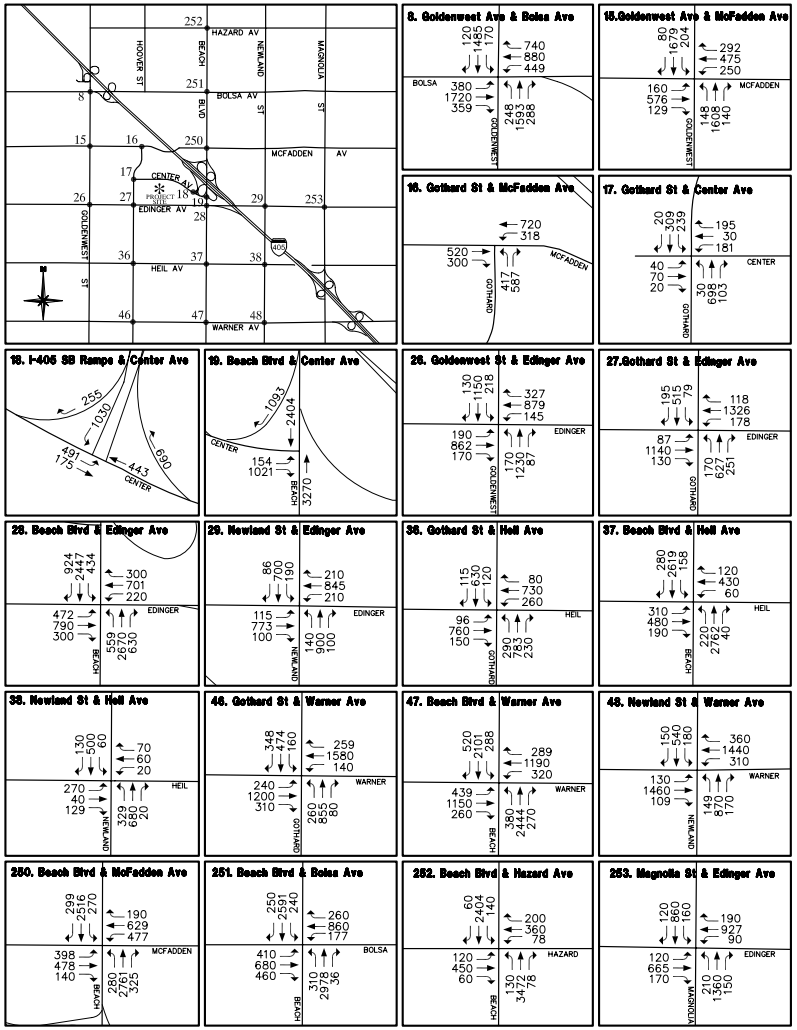


Figure A-24

YEAR 2030 PM PEAK HOUR VOLUMES
- WITH-PROJECT
- ALTERNATIVE GPA

Appendix B

INTERSECTION CAPACITY UTILIZATION WORKSHEETS

Peak hour intersection volume/capacity ratios are calculated by means of intersection capacity utilization (ICU) values. ICU calculations were performed for the intersections shown in Figure B-1. For simplicity, signalization is assumed at each intersection. Precise ICU calculations of existing non-signalized intersections would require a more detailed analysis.

The procedure is based on the critical movement methodology, and shows the amount of capacity utilized by each critical move. A capacity of 1700 vehicles per hour (VPH) per lane is assumed together with a .05 clearance interval. A "de-facto" right-turn lane is used in the ICU calculation for cases where a curb lane is wide enough to separately serve both thru and right-turn traffic (typically with a width of 19 feet from curb to outside of thru-lane with parking prohibited during peak periods). Such lanes are treated the same as striped right-turn lanes during the ICU calculations, but they are denoted on the ICU calculation worksheets using the letter "d" in place of a numerical entry for right-turn lanes.

The methodology also incorporates a check for right-turn capacity utilization. Both right-turn-on-green (RTOG) and right-turn-on-red (RTOR) capacity availability are calculated and checked against the total right-turn capacity need. If insufficient capacity is available, then an adjustment is made to the total capacity utilization value. The following example shows how this adjustment is made.

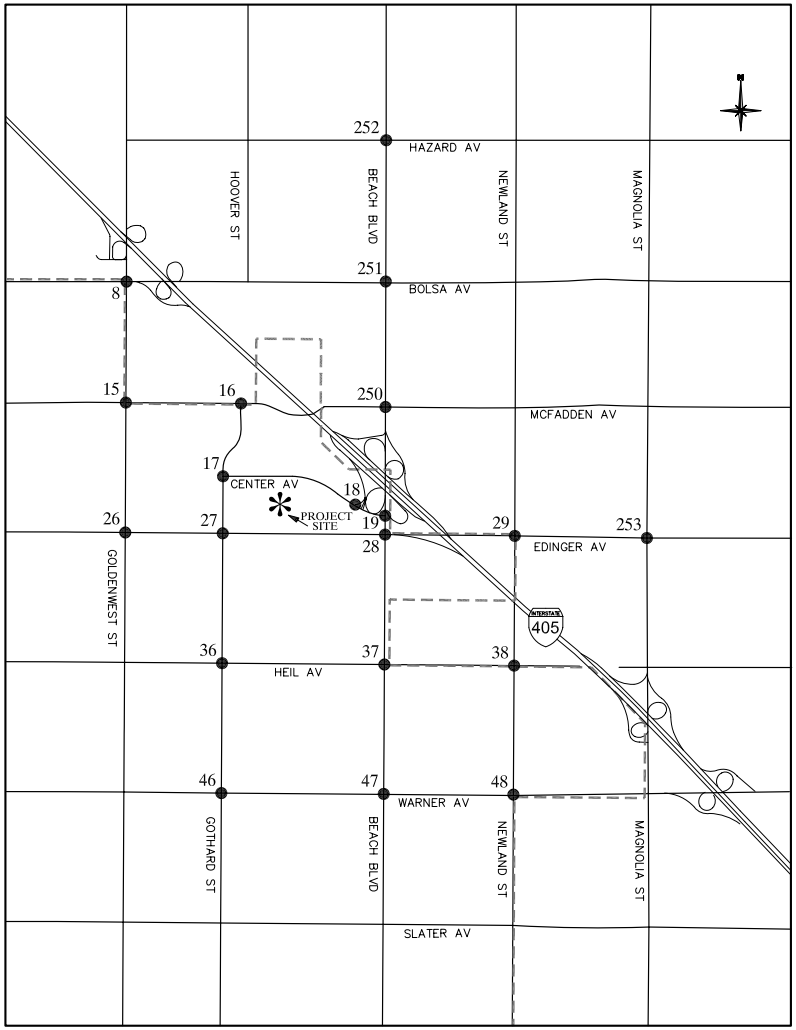
Example For Northbound Right

1. Right-Turn-On-Green (RTOG)

If NBT is critical move, then:
RTOG = V/C (NBT)
Otherwise,
RTOG = V/C (NBL) + V/C (SBT) - V/C (SBL)

2. Right-Turn-On-Red (RTOR)

If WBL is critical move, then:
RTOR = V/C (WBL)
Otherwise,
RTOR = V/C (EBL) + V/C (WBT) - V/C (EBT)



Legend

City Limits

Figure B-1

INTERSECTION LOCATION MAP

3. Right-Turn Overlap Adjustment

If the northbound right is assumed to overlap with the adjacent westbound left, adjustments to the RTOG and RTOR values are made as follows:

RTOG = RTOG + V/C (WBL)
RTOR = RTOR - V/C (WBL)

4. Total Right-Turn Capacity (RTC) Availability For NBR

RTC = RTOG + factor x RTOR
Where factor = RTOR saturation flow factor (75%)

Right-turn adjustment is then as follows: Additional ICU = V/C (NBR) - RTC

A zero or negative value indicates that adequate capacity is available and no adjustment is necessary. A positive value indicates that the available RTOR and RTOG capacity does not adequately accommodate the right-turn V/C, therefore the right-turn is essentially considered to be a critical movement. In such cases, the right-turn adjustment is noted on the ICU worksheet and it is included in the total capacity utilization value. When it is determined that a right-turn adjustment is required for more than one right-turn movement, the word "multi" is printed on the worksheet instead of an actual right-turn movement reference, and the right-turn adjustments are cumulatively added to the total capacity utilization value. In such cases, further operational evaluation is typically carried out to determine if under actual operational conditions, the critical right-turns would operate simultaneously, and therefore a right-turn adjustment credit should be applied.

Shared Lane V/C Methodology

For intersection approaches where shared usage of a lane is permitted by more than one turn movement (e.g., left/thru, thru/right, left/thru/right), the individual turn volumes are evaluated to determine whether dedication of the shared lane is warranted to any one given turn movement. The following example demonstrates how this evaluation is carried out:

Example for Shared Left/Thru Lane

1. Average Lane Volume (ALV)

$$ALV = \frac{\text{Left-Turn Volume + Thru Volume}}{\text{Total Left + Thru Approach Lanes (including shared lane)}}$$

2. ALV for Each Approach

$$ALV\ (Left) = \frac{\text{Left-Turn Volume}}{\text{Left Approach Lanes (including shared lane)}}$$

$$ALV\ (Thru) = \frac{\text{Thru Volume}}{\text{Thru Approach Lanes (including shared lane)}}$$

3. Lane Dedication is Warranted

If ALV (Left) is greater than ALV then full dedication of the shared lane to the left-turn approach is warranted. Left-turn and thru V/C ratios for this case are calculated as follows:

$$V/C\ (Left) = \frac{\text{Left-Turn Volume}}{\text{Left Approach Capacity (including shared lane)}}$$

$$V/C\ (Thru) = \frac{\text{Thru Volume}}{\text{Thru Approach Capacity (excluding shared lane)}}$$

Similarly, if ALV (Thru) is greater than ALV then full dedication to the thru approach is warranted, and left-turn and thru V/C ratios are calculated as follows:

$$V/C\ (Left) = \frac{\text{Left-Turn Volume}}{\text{Left Approach Capacity (excluding shared lane)}}$$

$$V/C\ (Thru) = \frac{\text{Thru Volume}}{\text{Thru Approach Capacity (including shared lane)}}$$

4. Lane Dedication is not Warranted

If ALV (Left) and ALV (Thru) are both less than ALV, the left/thru lane is assumed to be truly shared and each left, left/thru or thru approach lane carries an evenly distributed volume of traffic equal to ALV. A combined left/thru V/C ratio is calculated as follows:

$$V/C\ (Left/Thru) = \frac{\text{Left-Turn Volume + Thru Volume}}{\text{Total Left + Thru Approach Capacity (including shared lane)}}$$

This V/C (Left/Thru) ratio is assigned as the V/C (Thru) ratio for the critical movement analysis and ICU summary listing.

If split phasing has not been designated for this approach, the relative proportion of V/C (Thru) that is attributed to the left-turn volume is estimated as follows:

If approach has more than one left-turn (including shared lane), then:
V/C (Left) = V/C (Thru)

If approach has only one left-turn lane (shared lane), then:

$$V/C\ (Left) = \frac{\text{Left-Turn Volume}}{\text{Single Approach Lane Capacity}}$$

If this left-turn movement is determined to be a critical movement, the V/C (Left) value is posted in brackets on the ICU summary printout.

These same steps are carried out for shared thru/right lanes. If full dedication of a shared thru/right lane to the right-turn movement is warranted, the right-turn V/C value calculated in step three is checked against the RTOR and RTOG capacity availability if the option to include right-turns in the V/C ratio calculations is selected. If the V/C value that is determined using the shared lane methodology described here is reduced due to RTOR and RTOG capacity availability, the V/C value for the thru/right lanes is posted in brackets.

When an approach contains more than one shared lane (e.g., left/thru and thru/right), steps one and two listed above are carried out for the three turn movements combined. Step four is carried out if dedication is not warranted for either of the shared lanes. If dedication of one of the shared lanes is warranted to one movement or another, step three is carried out for the two movements involved, and then steps one through four are repeated for the two movements involved in the other shared lane.

EXISTING

8. Goldenwest St & Bolsa Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	100	.03	220	.06
NBT	3	5100	1120	.25*	1430	.33*
NBR	0	0	180		250	
SBL	1	1700	160	.09*	140	.08*
SBT	3	5100	1470	.29	1350	.26
SBR	d	1700	100	.06	110	.06
EBL	2	3400	140	.04*	370	.11
EBT	3	5100	590	.12	1190	.23*
EBR	1	1700	120	.07	340	.20
WBL	2	3400	280	.08	310	.09*
WBT	3	5100	1060	.21*	650	.13
WBR	1	1700	380	.22	560	.33
Right Turn Adjustment					WBR	.08*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .64 .86

15. Goldenwest St & Mcfadden Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	100	.06*	100	.06
NBT	3	5100	1020	.20	1310	.26*
NBR	d	1700	70	.04	100	.06
SBL	1	1700	220	.13	180	.11*
SBT	3	5100	1490	.31*	1480	.30
SBR	0	0	70		70	
EBL	1	1700	140	.08	140	.08
EBT	2	3400	520	.15*	580	.17*
EBR	d	1700	190	.11	130	.08
WBL	1	1700	180	.11*	220	.13*
WBT	2	3400	550	.16	470	.14
WBR	d	1700	140	.08	290	.17
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .68 .72

16. Gothard St & Mcfadden Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	190	.06*	420	.12*
NBT	0	0	0		0	
NBR	1	1700	240	.14	420	.25
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	2	3400	660	.19*	520	.15*
EBR	d	1700	360	.21	280	.16
WBL	1	1700	300	.18*	200	.12*
WBT	2	3400	570	.17	710	.21
WBR	0	0	0		0	
Right Turn Adjustment					NBR	.07*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .48 .51

17. Gothard St & Center Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	70	.04	30	.02
NBT	2	3400	360	.11*	630	.19*
NBR	d	1700	90	.05	100	.06
SBL	1	1700	90	.05*	130	.08*
SBT	2	3400	350	.10	310	.09
SBR	d	1700	40	.02	10	.01
EBL	1	1700	10	.01	20	.01
EBT	1	1700	10	.02*	50	.04*
EBR	0	0	20		20	
WBL	1	1700	80	.05*	180	.11*
WBT	2	3400	50	.03	20	.01
WBR	0	0	40		140	.08
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .28 .47

18. I-405 SB Ramps & Center Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3400	800	.24*	930	.27*
SBT	0	0	0		0	
SBR	1	1700	150	.09	200	.12
EBL	1	1700	50	.03*	350	.21*
EBT	2	3400	90	.03	210	.06
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	260	.08*	240	.07*
WBR	1	1700	310	.18	610	.36
Right Turn Adjustment					WBR	.15*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .40 .75

19. Beach Blvd & Center Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	4	6800	2320	.34	2740	.40*
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	4	6800	2550	.38*	2090	.31
SBR	f		520		820	
EBL	2	3400	80	.02*	160	.05*
EBT	0	0	0		0	
EBR	2	3400	830	.24	960	.28
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment			EBR	.22*	EBR	.18*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .67 .68

26. Goldenwest St & Edinger Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	130	.08	160	.09
NBT	3	5100	1130	.22*	1130	.22*
NBR	d	1700	100	.06	80	.05
SBL	1	1700	190	.11*	210	.12*
SBT	3	5100	1110	.22	1060	.21
SBR	d	1700	110	.06	100	.06
EBL	1	1700	150	.09	120	.07*
EBT	3	5100	1000	.20*	670	.13
EBR	d	1700	110	.06	160	.09
WBL	1	1700	60	.04*	140	.08
WBT	3	5100	480	.09	720	.14*
WBR	d	1700	80	.05	230	.14
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .62 .60

27. Gothard St & Edinger Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07*	120	.07
NBT	2	3400	430	.13	630	.19*
NBR	d	1700	90	.05	210	.12
SBL	1	1700	40	.02	70	.04*
SBT	2	3400	290	.09*	440	.13
SBR	d	1700	90	.05	160	.09
EBL	1	1700	90	.05*	80	.05*
EBT	3	5100	900	.18	1030	.20
EBR	d	1700	100	.06	120	.07
WBL	1	1700	90	.05	120	.07
WBT	3	5100	960	.21*	1110	.24*
WBR	0	0	90		110	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .47 .57

28. Beach Blvd & Edinger Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	130	.04	550	.16
NBT	3	5100	1690	.33*	2290	.45*
NBR	1	1700	390	.23	560	.33
SBL	2	3400	490	.14*	360	.11*
SBT	4	6800	2570	.38	2340	.34
SBR	2	3400	300	.09	680	.20
EBL	2	3400	170	.05	350	.10*
EBT	3	5100	670	.13*	710	.14
EBR	1	1700	120	.07	290	.17
WBL	1	1700	100	.06*	200	.12
WBT	2	3400	370	.11	580	.17*
WBR	1	1700	300	.18	270	.16
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .71 .88

29. Newland St & Edinger Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	180	.11*	110	.06
NBT	2	3400	400	.15	680	.23*
NBR	0	0	110		90	
SBL	1	1700	170	.10	100	.06*
SBT	2	3400	540	.18*	580	.19
SBR	0	0	80		80	
EBL	1	1700	30	.02	110	.06
EBT	2	3400	840	.25*	660	.19*
EBR	d	1700	90	.05	90	.05
WBL	1	1700	200	.12*	160	.09*
WBT	2	3400	660	.19	710	.21
WBR	d	1700	80	.05	180	.11
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .71 .62

36. Gothard St & Heil Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	130	.08*	270	.16*
NBT	2	3400	570	.17	700	.21
NBR	d	1700	120	.07	140	.08
SBL	1	1700	40	.02	70	.04
SBT	2	3400	520	.15*	550	.16*
SBR	d	1700	40	.02	120	.07
EBL	1	1700	120	.07	90	.05
EBT	2	3400	670	.20*	530	.16*
EBR	d	1700	180	.11	150	.09
WBL	1	1700	130	.08*	150	.09*
WBT	2	3400	400	.12	540	.16
WBR	d	1700	30	.02	60	.04
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .56 .62

37. Beach Blvd & Heil Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	150	.09*	190	.11*
NBT	4	6800	2080	.31	2570	.38
NBR	0	0	20		40	
SBL	1	1700	70	.04	150	.09
SBT	4	6800	2540	.40*	2530	.40*
SBR	0	0	180		210	
EBL	1	1700	170	.10*	170	.10*
EBT	2	3400	420	.12	300	.09
EBR	d	1700	210	.12	170	.10
WBL	1	1700	50	.03	50	.03
WBT	1	1700	240	.14*	230	.14*
WBR	1	1700	80	.05	110	.06
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .78 .80

38. Newland St & Heil Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	180	.11*	230	.14*
NBT	2	3400	430	.13	620	.18
NBR	d	1700	10	.01	20	.01
SBL	1	1700	30	.02	50	.03
SBT	2	3400	500	.15*	410	.12*
SBR	d	1700	160	.09	120	.07
EBL	1	1700	210	.12*	160	.09*
EBT	1	1700	70	.04	40	.02
EBR	1	1700	280	.16	120	.07
WBL	1	1700	10	.01	20	.01
WBT	1	1700	70	.08*	60	.06*
WBR	0	0	60		50	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .51 .46

46. Gothard St & Warner Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	130	.08	250	.15
NBT	2	3400	380	.11*	720	.21*
NBR	d	1700	40	.02	70	.04
SBL	1	1700	130	.08*	150	.09*
SBT	2	3400	340	.10	470	.14
SBR	d	1700	40	.02	180	.11
EBL	1	1700	180	.11	220	.13*
EBT	3	5100	1370	.27*	1070	.21
EBR	1	1700	200	.12	300	.18
WBL	1	1700	80	.05*	60	.04
WBT	3	5100	730	.14	1470	.29*
WBR	d	1700	120	.07	230	.14
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .56 .77

47. Beach Blvd & Warner Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	150	.04*	350	.10
NBT	4	6800	1320	.21	2330	.38*
NBR	0	0	110		260	
SBL	2	3400	260	.08	270	.08*
SBT	4	6800	1830	.27*	2050	.30
SBR	1	1700	240	.14	470	.28
EBL	2	3400	290	.09	430	.13*
EBT	3	5100	1160	.26*	1000	.25
EBR	0	0	160		250	
WBL	2	3400	250	.07*	290	.09
WBT	3	5100	700	.15	1100	.25*
WBR	0	0	60		200	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .69 .89

48. Newland St & Warner Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07	140	.08
NBT	2	3400	520	.15*	840	.25*
NBR	d	1700	150	.09	90	.05
SBL	1	1700	270	.16*	170	.10*
SBT	2	3400	800	.24	500	.15
SBR	d	1700	100	.06	80	.05
EBL	1	1700	50	.03	100	.06*
EBT	3	5100	1840	.36*	1250	.25
EBR	d	1700	110	.06	100	.06
WBL	1	1700	150	.09*	130	.08
WBT	2	3400	850	.25	1400	.41*
WBR	1	1700	120	.07	240	.14
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .81 .87

250. Beach Blvd & McFadden Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	190	.06*	270	.08
NBT	4	6800	1910	.30	2330	.38*
NBR	0	0	120		270	
SBL	2	3400	200	.06	240	.07*
SBT	4	6800	2360	.39*	2090	.34
SBR	0	0	270		240	
EBL	2	3400	270	.08*	360	.11*
EBT	2	3400	370	.15	460	.18
EBR	0	0	130		140	
WBL	2	3400	350	.10	390	.11
WBT	2	3400	520	.20*	490	.20*
WBR	0	0	170		180	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION **.78** **.81**

251. Beach Blvd & Bolsa Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	270	.08*	230	.07
NBT	4	6800	1960	.29	2510	.37*
NBR	0	0	10		40	
SBL	2	3400	150	.04	230	.07*
SBT	4	6800	2210	.35*	2210	.35
SBR	0	0	150		170	
EBL	1	1700	170	.10*	200	.12*
EBT	2	3400	480	.14	570	.17
EBR	1	1700	490	.29	360	.21
WBL	1	1700	130	.08	150	.09
WBT	2	3400	560	.16*	600	.18*
WBR	1	1700	180	.11	250	.15
Right Turn Adjustment			EBR	.07*		
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION **.81** **.79**

252. Beach Blvd & Hazard Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	90	.05*	110	.06
NBT	4	6800	2210	.33	2810	.42*
NBR	0	0	30		70	
SBL	1	1700	100	.06	130	.08*
SBT	4	6800	2810	.41*	2090	.31
SBR	d	1700	80	.05	50	.03
EBL	1	1700	50	.03*	80	.05
EBT	2	3400	270	.08	370	.11*
EBR	1	1700	100	.06	30	.02
WBL	1	1700	80	.05	70	.04*
WBT	2	3400	340	.10*	310	.09
WBR	d	1700	170	.10	200	.12
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION **.64** **.70**

253. Magnolia St & Edinger Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	210	.12*	200	.12
NBT	3	5100	720	.16	1100	.24*
NBR	0	0	90		130	
SBL	1	1700	230	.14	150	.09*
SBT	3	5100	1660	.33*	810	.16
SBR	d	1700	90	.05	90	.05
EBL	1	1700	70	.04	110	.06*
EBT	2	3400	760	.22*	590	.17
EBR	d	1700	300	.18	100	.06
WBL	1	1700	110	.06*	80	.05
WBT	2	3400	570	.17	780	.23*
WBR	d	1700	80	.05	180	.11
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION **.78** **.67**

2014

8. Goldenwest Ave & Bolsa Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	100	.03	230	.07
NBT	3	5100	1180	.27*	1480	.34*
NBR	0	0	190		260	
SBL	1	1700	230	.14*	150	.09*
SBT	3	5100	1490	.29	1390	.27
SBR	d	1700	110	.06	110	.06
EBL	2	3400	160	.05*	370	.11
EBT	3	5100	590	.12	1350	.26*
EBR	1	1700	120	.07	350	.21
WBL	2	3400	320	.09	350	.10*
WBT	3	5100	1160	.23*	720	.14
WBR	1	1700	420	.25	610	.36
Right Turn Adjustment					WBR	.07*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .74 .91

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	103	.03	233	.07
NBT	3	5100	1191	.27*	1492	.34*
NBR	0	0	193		263	
SBL	1	1700	230	.14*	150	.09*
SBT	3	5100	1496	.29	1406	.28
SBR	d	1700	110	.06	110	.06
EBL	2	3400	160	.05*	370	.11
EBT	3	5100	590	.12	1350	.26*
EBR	1	1700	121	.07	354	.21
WBL	2	3400	321	.09	354	.10*
WBT	3	5100	1160	.23*	720	.14
WBR	1	1700	420	.25	610	.36
Right Turn Adjustment					WBR	.07*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .74 .91

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	102	.03	232	.07
NBT	3	5100	1190	.27*	1489	.34*
NBR	0	0	192		262	
SBL	1	1700	230	.14*	150	.09*
SBT	3	5100	1493	.29	1402	.27
SBR	d	1700	110	.06	110	.06
EBL	2	3400	160	.05*	370	.11
EBT	3	5100	590	.12	1350	.26*
EBR	1	1700	121	.07	353	.21
WBL	2	3400	321	.09	353	.10*
WBT	3	5100	1160	.23*	720	.14
WBR	1	1700	420	.25	610	.36
Right Turn Adjustment					WBR	.07*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .74 .91

15. Goldenwest Ave & McFadden Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	100	.06*	120	.07*
NBT	3	5100	1110	.22	1400	.27
NBR	d	1700	70	.04	110	.06
SBL	1	1700	220	.13	190	.11
SBT	3	5100	1570	.32*	1540	.32*
SBR	0	0	80		70	
EBL	1	1700	140	.08	150	.09
EBT	2	3400	520	.15*	580	.17*
EBR	d	1700	190	.11	130	.08
WBL	1	1700	220	.13*	230	.14*
WBT	2	3400	550	.16	470	.14
WBR	d	1700	140	.08	290	.17
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .71 .75

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	103	.06*	123	.07
NBT	3	5100	1113	.22	1403	.28*
NBR	d	1700	70	.04	110	.06
SBL	1	1700	227	.13	210	.12*
SBT	3	5100	1571	.32*	1544	.32
SBR	0	0	80		70	
EBL	1	1700	140	.08	150	.09
EBT	2	3400	524	.15*	592	.17*
EBR	d	1700	191	.11	134	.08
WBL	1	1700	220	.13*	230	.14*
WBT	2	3400	558	.16	479	.14
WBR	d	1700	154	.09	305	.18
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .71 .76

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	102	.06*	122	.07
NBT	3	5100	1112	.22	1402	.27*
NBR	d	1700	70	.04	110	.06
SBL	1	1700	224	.13	205	.12*
SBT	3	5100	1571	.32*	1543	.32
SBR	0	0	80		70	
EBL	1	1700	140	.08	150	.09
EBT	2	3400	522	.15*	589	.17*
EBR	d	1700	191	.11	133	.08
WBL	1	1700	220	.13*	230	.14*
WBT	2	3400	557	.16	476	.14
WBR	d	1700	152	.09	300	.18
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .71 .75

16. Gothard St & Mcfadden Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	190	.06*	420	.12*
NBT	0	0	0		0	
NBR	1	1700	300	.18	470	.28
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	2	3400	660	.19*	520	.15*
EBR	d	1700	390	.23	290	.17
WBL	1	1700	330	.19*	240	.14*
WBT	2	3400	590	.17	710	.21
WBR	0	0	0		0	
Right Turn Adjustment			Multi	.03*	NBR	.09*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .52 .55

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	212	.06*	444	.13*
NBT	0	0	0		0	
NBR	1	1700	306	.18	476	.28
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	2	3400	660	.19*	520	.15*
EBR	d	1700	402	.24	321	.19
WBL	1	1700	333	.20*	248	.15*
WBT	2	3400	590	.17	710	.21
WBR	0	0	0		0	
Right Turn Adjustment			Multi	.04*	NBR	.07*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .54 .55

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	209	.06*	437	.13*
NBT	0	0	0		0	
NBR	1	1700	305	.18	474	.28
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	2	3400	660	.19*	520	.15*
EBR	d	1700	396	.23	314	.18
WBL	1	1700	331	.19*	246	.14*
WBT	2	3400	590	.17	710	.21
WBR	0	0	0		0	
Right Turn Adjustment			Multi	.03*	NBR	.08*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .52 .55

17. Gothard St & Center Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	70	.04	30	.02
NBT	2	3400	380	.11*	650	.19*
NBR	d	1700	90	.05	100	.06
SBL	1	1700	100	.06*	170	.10*
SBT	2	3400	400	.12	310	.09
SBR	d	1700	40	.02	10	.01
EBL	1	1700	10	.01	30	.02
EBT	1	1700	10	.02*	60	.05*
EBR	0	0	20		20	
WBL	1	1700	100	.06*	180	.11*
WBT	2	3400	80	.04	20	.01
WBR	0	0	40		160	.09
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .30 .50

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	70	.04	30	.02
NBT	2	3400	383	.11*	653	.19*
NBR	d	1700	98	.06	121	.07
SBL	1	1700	113	.07*	206	.12*
SBT	2	3400	401	.12	314	.09
SBR	d	1700	40	.02	10	.01
EBL	1	1700	10	.01	30	.02
EBT	1	1700	10	.02*	60	.05*
EBR	0	0	20		20	
WBL	1	1700	115	.07*	196	.12*
WBT	2	3400	80	.04	20	.01
WBR	0	0	65		187	.11
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .32 .53

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	70	.04	30	.02
NBT	2	3400	382	.11*	652	.19*
NBR	d	1700	94	.06	116	.07
SBL	1	1700	107	.06*	197	.12*
SBT	2	3400	401	.12	313	.09
SBR	d	1700	40	.02	10	.01
EBL	1	1700	10	.01	30	.02
EBT	1	1700	10	.02*	60	.05*
EBR	0	0	20		20	
WBL	1	1700	113	.07*	191	.11*
WBT	2	3400	80	.04	20	.01
WBR	0	0	61		179	.11
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .31 .52

18. I-405 SB Ramps & Center Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3400	840	.25*	960	.28*
SBT	0	0	0		0	
SBR	1	1700	160	.09	220	.13
EBL	1	1700	70	.04*	400	.24*
EBT	2	3400	90	.03	210	.06
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	330	.10*	310	.09*
WBR	1	1700	380	.22	630	.37
Right Turn Adjustment					WBR	.14*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .44 .80

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3400	840	.25*	960	.28*
SBT	0	0	0		0	
SBR	1	1700	177	.10	267	.16
EBL	1	1700	85	.05*	416	.24*
EBT	2	3400	148	.04	272	.08
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	351	.10*	366	.11*
WBR	1	1700	380	.22	630	.37
Right Turn Adjustment					WBR	.12*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .45 .80

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3400	840	.25*	960	.28*
SBT	0	0	0		0	
SBR	1	1700	169	.10	256	.15
EBL	1	1700	83	.05*	411	.24*
EBT	2	3400	139	.04	253	.07
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	340	.10*	353	.10*
WBR	1	1700	380	.22	630	.37
Right Turn Adjustment					WBR	.13*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .45 .80

19. Beach Blvd & Center Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	4	6800	2460	.36	2900	.43*
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	4	6800	2690	.40*	2190	.32
SBR	f		650		910	
EBL	2	3400	80	.02*	170	.05*
EBT	0	0	0		0	
EBR	2	3400	870	.26	980	.29
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment			EBR	.24*	EBR	.18*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .71 .71

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	4	6800	2460	.36	2900	.43*
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	4	6800	2708	.40*	2240	.33
SBR	f		671		966	
EBL	2	3400	123	.04*	216	.06*
EBT	0	0	0		0	
EBR	2	3400	885	.26	996	.29
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment			EBR	.22*	EBR	.18*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .71 .72

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	4	6800	2460	.36	2900	.43*
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	4	6800	2699	.40*	2228	.33
SBR	f		660		953	
EBL	2	3400	116	.03*	202	.06*
EBT	0	0	0		0	
EBR	2	3400	883	.26	991	.29
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment			EBR	.23*	EBR	.18*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .71 .72

26. Goldenwest St & Edinger Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	140	.08	160	.09
NBT	3	5100	1170	.23*	1160	.23*
NBR	d	1700	120	.07	80	.05
SBL	1	1700	190	.11*	210	.12*
SBT	3	5100	1190	.23	1090	.21
SBR	d	1700	110	.06	110	.06
EBL	1	1700	150	.09	140	.08*
EBT	3	5100	1000	.20*	730	.14
EBR	d	1700	110	.06	160	.09
WBL	1	1700	60	.04*	140	.08
WBT	3	5100	540	.11	770	.15*
WBR	d	1700	100	.06	260	.15
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.63**		**.63**

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	140	.08	160	.09
NBT	3	5100	1170	.23*	1160	.23*
NBR	d	1700	124	.07	91	.05
SBL	1	1700	193	.11*	217	.13*
SBT	3	5100	1190	.23	1090	.21
SBR	d	1700	110	.06	110	.06
EBL	1	1700	150	.09	140	.08
EBT	3	5100	1009	.20*	755	.15*
EBR	d	1700	110	.06	160	.09
WBL	1	1700	68	.04*	148	.09*
WBT	3	5100	558	.11	789	.15
WBR	d	1700	105	.06	265	.16
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.63**		**.65**

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	140	.08	160	.09
NBT	3	5100	1170	.23*	1160	.23*
NBR	d	1700	122	.07	88	.05
SBL	1	1700	191	.11*	215	.13*
SBT	3	5100	1190	.23	1090	.21
SBR	d	1700	110	.06	110	.06
EBL	1	1700	150	.09	140	.08
EBT	3	5100	1005	.20*	749	.15*
EBR	d	1700	110	.06	160	.09
WBL	1	1700	67	.04*	146	.09*
WBT	3	5100	555	.11	783	.15
WBR	d	1700	104	.06	264	.16
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.63**		**.65**

27. Gothard St & Edinger Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07*	140	.08
NBT	2	3400	470	.14	630	.19*
NBR	d	1700	90	.05	230	.14
SBL	1	1700	50	.03	70	.04*
SBT	2	3400	330	.10*	460	.14
SBR	d	1700	100	.06	170	.10
EBL	1	1700	90	.05*	80	.05*
EBT	3	5100	960	.19	1070	.21
EBR	d	1700	110	.06	120	.07
WBL	1	1700	90	.05	140	.08
WBT	3	5100	1010	.22*	1180	.25*
WBR	0	0	90		110	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.49**		**.58**

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07*	140	.08
NBT	2	3400	474	.14	641	.19*
NBR	d	1700	101	.06	259	.15
SBL	1	1700	51	.03	74	.04*
SBT	2	3400	338	.10*	468	.14
SBR	d	1700	108	.06	178	.10
EBL	1	1700	94	.06*	91	.05
EBT	3	5100	972	.19	1103	.22*
EBR	d	1700	110	.06	120	.07
WBL	1	1700	111	.07	162	.10*
WBT	3	5100	1033	.22*	1205	.26
WBR	0	0	93		113	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.50**		**.60**

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07*	140	.08
NBT	2	3400	472	.14	638	.19*
NBR	d	1700	95	.06	252	.15
SBL	1	1700	51	.03	73	.04*
SBT	2	3400	336	.10*	466	.14
SBR	d	1700	106	.06	176	.10
EBL	1	1700	92	.05*	88	.05*
EBT	3	5100	966	.19	1095	.21
EBR	d	1700	110	.06	120	.07
WBL	1	1700	106	.06	155	.09
WBT	3	5100	1028	.22*	1197	.26*
WBR	0	0	92		112	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.49**		**.59**

28. Beach Blvd & Edinger Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	130	.04	560	.16
NBT	3	5100	1800	.35*	2400	.47*
NBR	1	1700	390	.23	580	.34
SBL	2	3400	540	.16*	380	.11*
SBT	4	6800	2650	.39	2370	.35
SBR	2	3400	340	.10	760	.22
EBL	2	3400	180	.05	390	.11*
EBT	3	5100	710	.14*	740	.15
EBR	1	1700	120	.07	300	.18
WBL	2	3400	110	.03*	210	.06
WBT	2	3400	400	.12	620	.18*
WBR	1	1700	310	.18	280	.16
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.73**		**.92**

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	143	.04	594	.17
NBT	3	5100	1800	.35*	2400	.47*
NBR	1	1700	390	.23	580	.34
SBL	2	3400	550	.16*	391	.12*
SBT	4	6800	2655	.39	2375	.35
SBR	2	3400	358	.11	810	.24
EBL	2	3400	211	.06	423	.12*
EBT	3	5100	743	.15*	775	.15
EBR	1	1700	137	.08	318	.19
WBL	2	3400	110	.03*	210	.06
WBT	2	3400	410	.12	649	.19*
WBR	1	1700	310	.18	280	.16
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.74**		**.95**

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	136	.04	586	.17
NBT	3	5100	1800	.35*	2400	.47*
NBR	1	1700	390	.23	580	.34
SBL	2	3400	549	.16*	388	.11*
SBT	4	6800	2654	.39	2374	.35
SBR	2	3400	349	.10	798	.23
EBL	2	3400	206	.06*	413	.12*
EBT	3	5100	738	.14	765	.15
EBR	1	1700	134	.08	312	.18
WBL	2	3400	110	.03	210	.06
WBT	2	3400	405	.12*	642	.19*
WBR	1	1700	310	.18	280	.16
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.74**		**.94**

29. Newland St & Edinger Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	190	.11*	120	.07
NBT	2	3400	410	.16	750	.25*
NBR	0	0	130		90	
SBL	1	1700	170	.10	130	.08*
SBT	2	3400	670	.23*	620	.21
SBR	0	0	100		80	
EBL	1	1700	50	.03	110	.06
EBT	2	3400	850	.25*	700	.21*
EBR	d	1700	100	.06	90	.05
WBL	1	1700	200	.12*	180	.11*
WBT	2	3400	700	.21	750	.22
WBR	d	1700	80	.05	190	.11
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.76**		**.70**

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	190	.11*	120	.07
NBT	2	3400	410	.16	750	.25*
NBR	0	0	130		90	
SBL	1	1700	170	.10	130	.08*
SBT	2	3400	670	.23*	620	.21
SBR	0	0	104		92	
EBL	1	1700	58	.03	119	.07
EBT	2	3400	861	.25*	712	.21*
EBR	d	1700	100	.06	90	.05
WBL	1	1700	200	.12*	180	.11*
WBT	2	3400	706	.21	766	.23
WBR	d	1700	80	.05	190	.11
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.76**		**.70**

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	190	.11*	120	.07
NBT	2	3400	410	.16	750	.25*
NBR	0	0	130		90	
SBL	1	1700	170	.10	130	.08*
SBT	2	3400	670	.23*	620	.21
SBR	0	0	102		89	
EBL	1	1700	57	.03	116	.07
EBT	2	3400	860	.25*	709	.21*
EBR	d	1700	100	.06	90	.05
WBL	1	1700	200	.12*	180	.11*
WBT	2	3400	703	.21	762	.22
WBR	d	1700	80	.05	190	.11
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.76**		**.70**

36. Gothard St & Heil Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	140	.08*	280	.16*
NBT	2	3400	610	.18	730	.21
NBR	d	1700	140	.08	170	.10
SBL	1	1700	40	.02	90	.05
SBT	2	3400	540	.16*	580	.17*
SBR	d	1700	40	.02	120	.07
EBL	1	1700	120	.07	90	.05
EBT	2	3400	720	.21*	600	.18*
EBR	d	1700	180	.11	150	.09
WBL	1	1700	180	.11*	180	.11*
WBT	2	3400	430	.13	600	.18
WBR	d	1700	30	.02	70	.04
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .61 .67

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	140	.08*	280	.16*
NBT	2	3400	619	.18	753	.22
NBR	d	1700	140	.08	170	.10
SBL	1	1700	40	.02	90	.05
SBT	2	3400	557	.16*	598	.18*
SBR	d	1700	49	.03	129	.08
EBL	1	1700	125	.07	102	.06
EBT	2	3400	720	.21*	600	.18*
EBR	d	1700	180	.11	150	.09
WBL	1	1700	180	.11*	180	.11*
WBT	2	3400	430	.13	600	.18
WBR	d	1700	30	.02	70	.04
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .61 .68

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	140	.08*	280	.16*
NBT	2	3400	614	.18	748	.22
NBR	d	1700	140	.08	170	.10
SBL	1	1700	40	.02	90	.05
SBT	2	3400	554	.16*	592	.17*
SBR	d	1700	47	.03	127	.07
EBL	1	1700	122	.07	100	.06
EBT	2	3400	720	.21*	600	.18*
EBR	d	1700	180	.11	150	.09
WBL	1	1700	180	.11*	180	.11*
WBT	2	3400	430	.13	600	.18
WBR	d	1700	30	.02	70	.04
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .61 .67

37. Beach Blvd & Heil Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	150	.09*	200	.12*
NBT	4	6800	2190	.33	2630	.39
NBR	0	0	20		40	
SBL	1	1700	70	.04	150	.09
SBT	4	6800	2560	.41*	2560	.41*
SBR	0	0	230		230	
EBL	1	1700	170	.10*	210	.12*
EBT	2	3400	480	.14	350	.10
EBR	d	1700	220	.13	180	.11
WBL	1	1700	50	.03	50	.03
WBT	2	3400	280	.11*	290	.12*
WBR	0	0	80		110	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .76 .82

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	150	.09*	200	.12*
NBT	4	6800	2200	.33	2657	.40
NBR	0	0	20		40	
SBL	1	1700	73	.04	153	.09
SBT	4	6800	2579	.41*	2580	.41*
SBR	0	0	230		230	
EBL	1	1700	170	.10*	210	.12*
EBT	2	3400	480	.14	350	.10
EBR	d	1700	220	.13	180	.11
WBL	1	1700	50	.03	50	.03
WBT	2	3400	280	.11*	290	.12*
WBR	0	0	80		110	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .76 .82

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	150	.09*	200	.12*
NBT	4	6800	2195	.33	2650	.40
NBR	0	0	20		40	
SBL	1	1700	72	.04	152	.09
SBT	4	6800	2576	.41*	2574	.41*
SBR	0	0	230		230	
EBL	1	1700	170	.10*	210	.12*
EBT	2	3400	480	.14	350	.10
EBR	d	1700	220	.13	180	.11
WBL	1	1700	50	.03	50	.03
WBT	2	3400	280	.11*	290	.12*
WBR	0	0	80		110	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .76 .82

38. Newland St & Heil Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	190	.11*	260	.15*
NBT	2	3400	450	.13	640	.19
NBR	d	1700	10	.01	20	.01
SBL	1	1700	40	.02	50	.03
SBT	2	3400	580	.17*	440	.13*
SBR	d	1700	180	.11	120	.07
EBL	1	1700	230	.14*	190	.11*
EBT	1	1700	70	.04	40	.02
EBR	1	1700	280	.16	120	.07
WBL	1	1700	10	.01	20	.01
WBT	1	1700	70	.08*	60	.07*
WBR	0	0	60		60	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.55**		**.51**

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	191	.11*	263	.15*
NBT	2	3400	450	.13	640	.19
NBR	d	1700	10	.01	20	.01
SBL	1	1700	40	.02	50	.03
SBT	2	3400	580	.17*	440	.13*
SBR	d	1700	180	.11	120	.07
EBL	1	1700	230	.14*	190	.11*
EBT	1	1700	70	.04	40	.02
EBR	1	1700	282	.17	122	.07
WBL	1	1700	10	.01	20	.01
WBT	1	1700	70	.08*	60	.07*
WBR	0	0	60		60	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.55**		**.51**

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	191	.11*	262	.15*
NBT	2	3400	450	.13	640	.19
NBR	d	1700	10	.01	20	.01
SBL	1	1700	40	.02	50	.03
SBT	2	3400	580	.17*	440	.13*
SBR	d	1700	180	.11	120	.07
EBL	1	1700	230	.14*	190	.11*
EBT	1	1700	70	.04	40	.02
EBR	1	1700	282	.17	122	.07
WBL	1	1700	10	.01	20	.01
WBT	1	1700	70	.08*	60	.07*
WBR	0	0	60		60	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.55**		**.51**

46. Gothard St & Warner Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	130	.08	250	.15
NBT	2	3400	440	.13*	760	.22*
NBR	d	1700	50	.03	70	.04
SBL	1	1700	130	.08*	150	.09*
SBT	2	3400	400	.12	470	.14
SBR	d	1700	50	.03	230	.14
EBL	1	1700	180	.11	230	.14*
EBT	3	5100	1410	.28*	1110	.22
EBR	1	1700	210	.12	300	.18
WBL	1	1700	80	.05*	80	.05
WBT	3	5100	740	.15	1500	.29*
WBR	d	1700	130	.08	240	.14
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.59**		**.79**

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	130	.08	250	.15
NBT	2	3400	445	.13*	775	.23*
NBR	d	1700	50	.03	70	.04
SBL	1	1700	130	.08*	150	.09*
SBT	2	3400	410	.12	481	.14
SBR	d	1700	53	.03	233	.14
EBL	1	1700	180	.11	230	.14*
EBT	3	5100	1410	.28*	1110	.22
EBR	1	1700	210	.12	300	.18
WBL	1	1700	80	.05*	80	.05
WBT	3	5100	740	.15	1500	.29*
WBR	d	1700	131	.08	244	.14
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.59**		**.80**

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	130	.08	250	.15
NBT	2	3400	443	.13*	771	.23*
NBR	d	1700	50	.03	70	.04
SBL	1	1700	130	.08*	150	.09*
SBT	2	3400	409	.12	478	.14
SBR	d	1700	52	.03	232	.14
EBL	1	1700	180	.11	230	.14*
EBT	3	5100	1410	.28*	1110	.22
EBR	1	1700	210	.12	300	.18
WBL	1	1700	80	.05*	80	.05
WBT	3	5100	740	.15	1500	.29*
WBR	d	1700	131	.08	243	.14
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.59**		**.80**

47. Beach Blvd & Warner Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	170	.05*	360	.11
NBT	4	6800	1380	.22	2370	.39*
NBR	0	0	140		260	
SBL	2	3400	270	.08	280	.08*
SBT	4	6800	1830	.27*	2070	.30
SBR	1	1700	270	.16	490	.29
EBL	2	3400	300	.09	430	.13*
EBT	3	5100	1160	.26*	1050	.25
EBR	0	0	160		250	
WBL	2	3400	300	.09*	300	.09
WBT	3	5100	720	.15	1130	.27*
WBR	0	0	60		230	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.72**		**.92**

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	170	.05*	360	.11
NBT	4	6800	1387	.22	2390	.39*
NBR	0	0	140		260	
SBL	2	3400	273	.08	283	.08*
SBT	4	6800	1844	.27*	2085	.31
SBR	1	1700	270	.16	490	.29
EBL	2	3400	301	.09	434	.13*
EBT	3	5100	1160	.26*	1050	.25
EBR	0	0	160		250	
WBL	2	3400	300	.09*	300	.09
WBT	3	5100	720	.15	1130	.27*
WBR	0	0	61		233	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.72**		**.92**

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	170	.05*	360	.11
NBT	4	6800	1384	.22	2386	.39*
NBR	0	0	140		260	
SBL	2	3400	272	.08	282	.08*
SBT	4	6800	1842	.27*	2081	.31
SBR	1	1700	270	.16	490	.29
EBL	2	3400	301	.09	433	.13*
EBT	3	5100	1160	.26*	1050	.25
EBR	0	0	160		250	
WBL	2	3400	300	.09*	300	.09
WBT	3	5100	720	.15	1130	.27*
WBR	0	0	61		232	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.72**		**.92**

48. Newland St & Warner Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07	140	.08
NBT	2	3400	520	.15*	850	.25*
NBR	d	1700	170	.10	110	.06
SBL	1	1700	270	.16*	170	.10*
SBT	2	3400	810	.24	510	.15
SBR	d	1700	180	.11	100	.06
EBL	1	1700	50	.03	110	.06*
EBT	3	5100	1890	.37*	1310	.26
EBR	d	1700	110	.06	100	.06
WBL	1	1700	170	.10*	180	.11
WBT	2	3400	860	.25	1410	.41*
WBR	1	1700	150	.09	280	.16
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.83**		**.87**

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	121	.07	142	.08
NBT	2	3400	520	.15*	850	.25*
NBR	d	1700	170	.10	110	.06
SBL	1	1700	270	.16*	170	.10*
SBT	2	3400	810	.24	510	.15
SBR	d	1700	180	.11	100	.06
EBL	1	1700	50	.03	110	.06*
EBT	3	5100	1890	.37*	1310	.26
EBR	d	1700	112	.07	102	.06
WBL	1	1700	170	.10*	180	.11
WBT	2	3400	860	.25	1410	.41*
WBR	1	1700	150	.09	280	.16
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.83**		**.87**

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07	142	.08
NBT	2	3400	520	.15*	850	.25*
NBR	d	1700	170	.10	110	.06
SBL	1	1700	270	.16*	170	.10*
SBT	2	3400	810	.24	510	.15
SBR	d	1700	180	.11	100	.06
EBL	1	1700	50	.03	110	.06*
EBT	3	5100	1890	.37*	1310	.26
EBR	d	1700	111	.07	101	.06
WBL	1	1700	170	.10*	180	.11
WBT	2	3400	860	.25	1410	.41*
WBR	1	1700	150	.09	280	.16
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.83**		**.87**

250. Beach Blvd & McFadden Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	190	.06*	270	.08
NBT	4	6800	2010	.32	2470	.41*
NBR	0	0	140		290	
SBL	2	3400	210	.06	250	.07*
SBT	4	6800	2500	.41*	2220	.36
SBR	0	0	310		260	
EBL	2	3400	270	.08*	370	.11*
EBT	2	3400	410	.16	470	.18
EBR	0	0	130		140	
WBL	2	3400	380	.11	420	.12
WBT	2	3400	520	.20*	530	.21*
WBR	0	0	170		180	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .80 .85

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	190	.06*	270	.08
NBT	4	6800	2041	.32	2504	.41*
NBR	0	0	148		298	
SBL	2	3400	210	.06	250	.07*
SBT	4	6800	2516	.42*	2264	.37
SBR	0	0	312		264	
EBL	2	3400	273	.08*	373	.11*
EBT	2	3400	413	.16	473	.18
EBR	0	0	130		140	
WBL	2	3400	384	.11	431	.13
WBT	2	3400	521	.20*	534	.21*
WBR	0	0	170		180	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .81 .85

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	190	.06*	270	.08
NBT	4	6800	2036	.32	2493	.41*
NBR	0	0	146		296	
SBL	2	3400	210	.06	250	.07*
SBT	4	6800	2508	.41*	2254	.37
SBR	0	0	311		263	
EBL	2	3400	272	.08*	372	.11*
EBT	2	3400	412	.16	472	.18
EBR	0	0	130		140	
WBL	2	3400	382	.11	428	.13
WBT	2	3400	521	.20*	533	.21*
WBR	0	0	170		180	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .80 .85

251. Beach Blvd & Bolsa Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	270	.08*	250	.07
NBT	4	6800	2050	.30	2650	.40*
NBR	0	0	10		40	
SBL	2	3400	150	.04	230	.07*
SBT	4	6800	2390	.38*	2330	.37
SBR	0	0	190		190	
EBL	1	1700	190	.11*	260	.15*
EBT	2	3400	520	.15	600	.18
EBR	1	1700	510	.30	390	.23
WBL	1	1700	130	.08	160	.09
WBT	2	3400	580	.17*	680	.20*
WBR	1	1700	180	.11	250	.15
Right Turn Adjustment			EBR	.06*		
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .85 .87

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	270	.08*	250	.07
NBT	4	6800	2071	.31	2672	.40*
NBR	0	0	17		47	
SBL	2	3400	150	.04	230	.07*
SBT	4	6800	2401	.38*	2360	.38
SBR	0	0	190		190	
EBL	1	1700	190	.11*	260	.15*
EBT	2	3400	520	.15	600	.18
EBR	1	1700	510	.30	390	.23
WBL	1	1700	134	.08	170	.10
WBT	2	3400	580	.17*	680	.20*
WBR	1	1700	180	.11	250	.15
Right Turn Adjustment			EBR	.06*		
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .85 .87

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	270	.08*	250	.07
NBT	4	6800	2068	.31	2666	.40*
NBR	0	0	16		45	
SBL	2	3400	150	.04	230	.07*
SBT	4	6800	2395	.38*	2353	.37
SBR	0	0	190		190	
EBL	1	1700	190	.11*	260	.15*
EBT	2	3400	520	.15	600	.18
EBR	1	1700	510	.30	390	.23
WBL	1	1700	132	.08	167	.10
WBT	2	3400	580	.17*	680	.20*
WBR	1	1700	180	.11	250	.15
Right Turn Adjustment			EBR	.06*		
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .85 .87

252. Beach Blvd & Hazard Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	100	.06*	120	.07
NBT	4	6800	2300	.34	3010	.45*
NBR	0	0	30		70	
SBL	1	1700	100	.06	130	.08*
SBT	4	6800	3050	.45*	2190	.32
SBR	d	1700	80	.05	50	.03
EBL	1	1700	50	.03*	90	.05*
EBT	2	3400	280	.08	390	.11
EBR	1	1700	110	.06	40	.02
WBL	1	1700	80	.05	70	.04
WBT	2	3400	350	.10*	330	.10*
WBR	d	1700	170	.10	200	.12
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .69 .73

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	100	.06*	120	.07
NBT	4	6800	2313	.35	3024	.46*
NBR	0	0	34		74	
SBL	1	1700	100	.06	130	.08*
SBT	4	6800	3057	.45*	2209	.32
SBR	d	1700	80	.05	50	.03
EBL	1	1700	50	.03*	90	.05*
EBT	2	3400	280	.08	390	.11
EBR	1	1700	110	.06	40	.02
WBL	1	1700	82	.05	76	.04
WBT	2	3400	350	.10*	330	.10*
WBR	d	1700	170	.10	200	.12
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .69 .74

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	100	.06*	120	.07
NBT	4	6800	2311	.34	3020	.45*
NBR	0	0	33		73	
SBL	1	1700	100	.06	130	.08*
SBT	4	6800	3053	.45*	2204	.32
SBR	d	1700	80	.05	50	.03
EBL	1	1700	50	.03*	90	.05*
EBT	2	3400	280	.08	390	.11
EBR	1	1700	110	.06	40	.02
WBL	1	1700	81	.05	74	.04
WBT	2	3400	350	.10*	330	.10*
WBR	d	1700	170	.10	200	.12
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .69 .73

253. Magnolia St & Edinger Ave

2014 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	210	.12*	200	.12
NBT	3	5100	740	.16	1180	.26*
NBR	0	0	100		140	
SBL	1	1700	230	.14	150	.09*
SBT	3	5100	1740	.34*	830	.16
SBR	d	1700	90	.05	100	.06
EBL	1	1700	70	.04	110	.06*
EBT	2	3400	790	.23*	610	.18
EBR	d	1700	300	.18	120	.07
WBL	1	1700	110	.06*	80	.05
WBT	2	3400	600	.18	830	.24*
WBR	d	1700	80	.05	180	.11
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .80 .70

2014 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	210	.12*	200	.12
NBT	3	5100	740	.16	1180	.26*
NBR	0	0	100		140	
SBL	1	1700	230	.14	150	.09*
SBT	3	5100	1740	.34*	830	.16
SBR	d	1700	90	.05	100	.06
EBL	1	1700	70	.04	110	.06*
EBT	2	3400	798	.23*	618	.18
EBR	d	1700	300	.18	120	.07
WBL	1	1700	110	.06*	80	.05
WBT	2	3400	604	.18	841	.25*
WBR	d	1700	80	.05	180	.11
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .80 .71

2014 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	210	.12*	200	.12
NBT	3	5100	740	.16	1180	.26*
NBR	0	0	100		140	
SBL	1	1700	230	.14	150	.09*
SBT	3	5100	1740	.34*	830	.16
SBR	d	1700	90	.05	100	.06
EBL	1	1700	70	.04	110	.06*
EBT	2	3400	796	.23*	616	.18
EBR	d	1700	300	.18	120	.07
WBL	1	1700	110	.06*	80	.05
WBT	2	3400	602	.18	838	.25*
WBR	d	1700	80	.05	180	.11
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .80 .71

2030

8. Goldenwest St & Bolsa Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	100	.03	250	.07
NBT	3	5100	1310	.30*	1600	.37*
NBR	0	0	220		290	
SBL	1	1700	380	.22*	170	.10*
SBT	3	5100	1540	.30	1490	.29
SBR	d	1700	120	.07	120	.07
EBL	2	3400	210	.06*	380	.11
EBT	3	5100	600	.12	1720	.34*
EBR	1	1700	130	.08	360	.21
WBL	2	3400	410	.12	450	.13*
WBT	3	5100	1390	.27*	880	.17
WBR	1	1700	500	.29	740	.44
Right Turn Adjustment					WBR	.03*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.90		1.02

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	101	.03	249	.07
NBT	3	5100	1313	.30*	1597	.37*
NBR	0	0	221		289	
SBL	1	1700	380	.22*	170	.10*
SBT	3	5100	1542	.30	1489	.29
SBR	d	1700	120	.07	120	.07
EBL	2	3400	210	.06*	380	.11
EBT	3	5100	600	.12	1720	.34*
EBR	1	1700	130	.08	360	.21
WBL	2	3400	410	.12	450	.13*
WBT	3	5100	1390	.27*	880	.17
WBR	1	1700	500	.29	740	.44
Right Turn Adjustment					WBR	.03*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.90		1.02

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	100	.03	248	.07
NBT	3	5100	1311	.30*	1593	.37*
NBR	0	0	220		288	
SBL	1	1700	380	.22*	170	.10*
SBT	3	5100	1539	.30	1485	.29
SBR	d	1700	120	.07	120	.07
EBL	2	3400	210	.06*	380	.11
EBT	3	5100	600	.12	1720	.34*
EBR	1	1700	130	.08	359	.21
WBL	2	3400	410	.12	449	.13*
WBT	3	5100	1390	.27*	880	.17
WBR	1	1700	500	.29	740	.44
Right Turn Adjustment					WBR	.03*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.90		1.02

15. Goldenwest St & Mcfadden Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	110	.06*	150	.09*
NBT	3	5100	1320	.26	1610	.32
NBR	d	1700	80	.05	140	.08
SBL	1	1700	220	.13	210	.12
SBT	3	5100	1760	.36*	1680	.35*
SBR	0	0	90		80	
EBL	1	1700	150	.09	160	.09
EBT	2	3400	530	.16*	580	.17*
EBR	d	1700	200	.12	130	.08
WBL	1	1700	320	.19*	250	.15*
WBT	2	3400	560	.16	480	.14
WBR	d	1700	150	.09	300	.18
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .82 .81

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	111	.07*	149	.09*
NBT	3	5100	1321	.26	1609	.32
NBR	d	1700	80	.05	140	.08
SBL	1	1700	222	.13	209	.12
SBT	3	5100	1760	.36*	1680	.35*
SBR	0	0	90		80	
EBL	1	1700	150	.09	160	.09
EBT	2	3400	531	.16*	579	.17*
EBR	d	1700	200	.12	130	.08
WBL	1	1700	320	.19*	250	.15*
WBT	2	3400	562	.17	478	.14
WBR	d	1700	154	.09	296	.17
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .83 .81

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	110	.06*	148	.09
NBT	3	5100	1320	.26	1608	.32*
NBR	d	1700	80	.05	140	.08
SBL	1	1700	218	.13	204	.12*
SBT	3	5100	1760	.36*	1679	.34
SBR	0	0	90		80	
EBL	1	1700	150	.09	160	.09
EBT	2	3400	529	.16*	576	.17*
EBR	d	1700	200	.12	129	.08
WBL	1	1700	320	.19*	250	.15*
WBT	2	3400	561	.17	475	.14
WBR	d	1700	151	.09	292	.17
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .82 .81

16. Gothard St & Mcfadden Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	200	.06*	430	.13*
NBT	0	0	0		0	
NBR	1	1700	430	.25	590	.35
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	2	3400	670	.20*	520	.15*
EBR	d	1700	470	.28	310	.18
WBL	1	1700	410	.24*	320	.19*
WBT	2	3400	620	.18	720	.21
WBR	0	0	0		0	
Right Turn Adjustment		Multi		.12*	NBR	.12*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .67 .64

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	206	.06*	424	.12*
NBT	0	0	0		0	
NBR	1	1700	431	.25	589	.35
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	2	3400	670	.20*	520	.15*
EBR	d	1700	473	.28	308	.18
WBL	1	1700	411	.24*	319	.19*
WBT	2	3400	620	.18	720	.21
WBR	0	0	0		0	
Right Turn Adjustment		Multi		.12*	NBR	.13*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .67 .64

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	202	.06*	417	.12*
NBT	0	0	0		0	
NBR	1	1700	431	.25	587	.35
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	0	0	0		0	
EBT	2	3400	670	.20*	520	.15*
EBR	d	1700	467	.27	300	.18
WBL	1	1700	409	.24*	318	.19*
WBT	2	3400	620	.18	720	.21
WBR	0	0	0		0	
Right Turn Adjustment		Multi		.11*	NBR	.13*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .66 .64

17. Gothard St & Center Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	70	.04	30	.02
NBT	2	3400	440	.13*	700	.21*
NBR	d	1700	100	.06	110	.06
SBL	1	1700	130	.08*	250	.15*
SBT	2	3400	520	.15	310	.09
SBR	d	1700	50	.03	20	.01
EBL	1	1700	20	.01	40	.02
EBT	1	1700	10	.02*	70	.05*
EBR	0	0	20		20	
WBL	1	1700	130	.08*	190	.11*
WBT	2	3400	160	.06	30	.02
WBR	0	0	40		210	.12
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .36 .57

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	70	.04	30	.02
NBT	2	3400	441	.13*	699	.21*
NBR	d	1700	102	.06	108	.06
SBL	1	1700	134	.08*	247	.15*
SBT	2	3400	520	.15	310	.09
SBR	d	1700	50	.03	20	.01
EBL	1	1700	20	.01	40	.02
EBT	1	1700	10	.02*	70	.05*
EBR	0	0	20		20	
WBL	1	1700	134	.08*	186	.11*
WBT	2	3400	160	.06	30	.02
WBR	0	0	47		203	.12
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .36 .57

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	70	.04	30	.02
NBT	2	3400	440	.13*	698	.21*
NBR	d	1700	98	.06	103	.06
SBL	1	1700	127	.07*	239	.14*
SBT	2	3400	520	.15	309	.09
SBR	d	1700	50	.03	20	.01
EBL	1	1700	20	.01	40	.02
EBT	1	1700	10	.02*	70	.05*
EBR	0	0	20		20	
WBL	1	1700	132	.08*	181	.11*
WBT	2	3400	160	.06	30	.02
WBR	0	0	43		195	.11
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .35 .56

18. I-405 SB Ramps & Center Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3400	920	.27*	1030	.30*
SBT	0	0	0		0	
SBR	1	1700	190	.11	270	.16
EBL	1	1700	100	.06*	500	.29*
EBT	2	3400	100	.03	210	.06
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	480	.14*	460	.14*
WBR	1	1700	530	.31	690	.41
Right Turn Adjustment			WBR	.03*	WBR	.12*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .55 .90

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3400	920	.27*	1030	.30*
SBT	0	0	0		0	
SBR	1	1700	195	.11	267	.16
EBL	1	1700	104	.06*	496	.29*
EBT	2	3400	116	.03	194	.06
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	486	.14*	456	.13*
WBR	1	1700	530	.31	690	.41
Right Turn Adjustment			WBR	.03*	WBR	.13*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .55 .90

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3400	920	.27*	1030	.30*
SBT	0	0	0		0	
SBR	1	1700	186	.11	255	.15
EBL	1	1700	102	.06*	491	.29*
EBT	2	3400	106	.03	175	.05
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	475	.14*	443	.13*
WBR	1	1700	530	.31	690	.41
Right Turn Adjustment			WBR	.03*	WBR	.13*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .55 .90

19. Beach Blvd & Center Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	4	6800	2770	.41	3270	.48*
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	4	6800	3020	.44*	2420	.36
SBR	f		960		1110	
EBL	2	3400	90	.03*	180	.05*
EBT	0	0	0		0	
EBR	2	3400	970	.29	1030	.30
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment			EBR	.26*	EBR	.19*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .78 .77

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	4	6800	2770	.41	3270	.48*
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	4	6800	3025	.44*	2416	.36
SBR	f		966		1106	
EBL	2	3400	102	.03*	168	.05*
EBT	0	0	0		0	
EBR	2	3400	974	.29	1026	.30
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment			EBR	.26*	EBR	.19*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .78 .77

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	4	6800	2770	.41	3270	.48*
NBR	0	0	0		0	
SBL	0	0	0		0	
SBT	4	6800	3016	.44*	2404	.35
SBR	f		955		1093	
EBL	2	3400	95	.03*	154	.05*
EBT	0	0	0		0	
EBR	2	3400	972	.29	1021	.30
WBL	0	0	0		0	
WBT	0	0	0		0	
WBR	0	0	0		0	
Right Turn Adjustment			EBR	.26*	EBR	.18*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .78 .76

26. Goldenwest St & Edinger Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	160	.09	170	.10
NBT	3	5100	1270	.25*	1230	.24*
NBR	d	1700	160	.09	90	.05
SBL	1	1700	200	.12*	220	.13*
SBT	3	5100	1390	.27	1150	.23
SBR	d	1700	120	.07	130	.08
EBL	1	1700	150	.09	190	.11*
EBT	3	5100	1010	.20*	870	.17
EBR	d	1700	120	.07	170	.10
WBL	1	1700	70	.04*	150	.09
WBT	3	5100	680	.13	890	.17*
WBR	d	1700	130	.08	330	.19
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .66 .70

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	160	.09	170	.10
NBT	3	5100	1270	.25*	1230	.24*
NBR	d	1700	161	.09	89	.05
SBL	1	1700	201	.12*	219	.13*
SBT	3	5100	1390	.27	1150	.23
SBR	d	1700	120	.07	130	.08
EBL	1	1700	150	.09	190	.11*
EBT	3	5100	1012	.20*	868	.17
EBR	d	1700	120	.07	170	.10
WBL	1	1700	72	.04*	148	.09
WBT	3	5100	685	.13	885	.17*
WBR	d	1700	131	.08	329	.19
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .66 .70

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	160	.09	170	.10
NBT	3	5100	1270	.25*	1230	.24*
NBR	d	1700	159	.09	87	.05
SBL	1	1700	199	.12*	218	.13*
SBT	3	5100	1390	.27	1150	.23
SBR	d	1700	120	.07	130	.08
EBL	1	1700	150	.09	190	.11*
EBT	3	5100	1008	.20*	862	.17
EBR	d	1700	120	.07	170	.10
WBL	1	1700	71	.04*	145	.09
WBT	3	5100	682	.13	879	.17*
WBR	d	1700	131	.08	327	.19
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .66 .70

27. Gothard St & Edinger Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07	170	.10*
NBT	2	3400	550	.16*	630	.19
NBR	d	1700	90	.05	260	.15
SBL	1	1700	70	.04*	80	.05
SBT	2	3400	420	.12	520	.15*
SBR	d	1700	130	.08	200	.12
EBL	1	1700	100	.06*	90	.05
EBT	3	5100	1090	.21	1150	.23*
EBR	d	1700	120	.07	130	.08
WBL	1	1700	100	.06	190	.11*
WBT	3	5100	1130	.24*	1340	.29
WBR	0	0	100		120	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.55**		**.64**

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07	170	.10*
NBT	2	3400	551	.16*	629	.19
NBR	d	1700	93	.05	258	.15
SBL	1	1700	70	.04*	80	.05
SBT	2	3400	422	.12	518	.15*
SBR	d	1700	132	.08	198	.12
EBL	1	1700	101	.06*	89	.05
EBT	3	5100	1093	.21	1148	.23*
EBR	d	1700	120	.07	130	.08
WBL	1	1700	106	.06	184	.11*
WBT	3	5100	1136	.24*	1334	.28
WBR	0	0	101		119	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.55**		**.64**

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07	170	.10*
NBT	2	3400	549	.16*	627	.18
NBR	d	1700	88	.05	251	.15
SBL	1	1700	70	.04*	79	.05
SBT	2	3400	421	.12	515	.15*
SBR	d	1700	131	.08	195	.11
EBL	1	1700	99	.06*	87	.05*
EBT	3	5100	1087	.21	1140	.22
EBR	d	1700	120	.07	130	.08
WBL	1	1700	102	.06	178	.10
WBT	3	5100	1132	.24*	1326	.28*
WBR	0	0	100		118	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.55**		**.63**

28. Beach Blvd & Edinger Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	140	.04	570	.17
NBT	3	5100	2070	.41*	2670	.52*
NBR	1	1700	400	.24	630	.37
SBL	2	3400	670	.20*	440	.13*
SBT	4	6800	2820	.41	2450	.36
SBR	2	3400	440	.13	940	.28
EBL	2	3400	200	.06*	490	.14*
EBT	3	5100	810	.16	810	.16
EBR	1	1700	120	.07	310	.18
WBL	2	3400	120	.04	220	.06
WBT	2	3400	460	.14*	710	.21*
WBR	1	1700	320	.19	300	.18
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.86**		**1.05**

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	143	.04	568	.17
NBT	3	5100	2070	.41*	2670	.52*
NBR	1	1700	400	.24	630	.37
SBL	2	3400	673	.20*	437	.13*
SBT	4	6800	2821	.41	2449	.36
SBR	2	3400	445	.13	936	.28
EBL	2	3400	208	.06*	482	.14*
EBT	3	5100	819	.16	801	.16
EBR	1	1700	124	.07	306	.18
WBL	2	3400	120	.04	220	.06
WBT	2	3400	463	.14*	708	.21*
WBR	1	1700	320	.19	300	.18
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.86**		**1.05**

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	137	.04	559	.16
NBT	3	5100	2070	.41*	2670	.52*
NBR	1	1700	400	.24	630	.37
SBL	2	3400	671	.20*	434	.13*
SBT	4	6800	2821	.41	2447	.36
SBR	2	3400	436	.13	924	.27
EBL	2	3400	203	.06	472	.14*
EBT	3	5100	814	.16*	790	.15
EBR	1	1700	122	.07	300	.18
WBL	2	3400	120	.04*	220	.06
WBT	2	3400	458	.13	701	.21*
WBR	1	1700	320	.19	300	.18
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.86**		**1.05**

29. Newland St & Edinger Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	200	.12*	140	.08
NBT	2	3400	420	.17	900	.29*
NBR	0	0	170		100	
SBL	1	1700	180	.11	190	.11*
SBT	2	3400	960	.32*	700	.23
SBR	0	0	140		90	
EBL	1	1700	90	.05	120	.07
EBT	2	3400	880	.26*	780	.23*
EBR	d	1700	110	.06	100	.06
WBL	1	1700	210	.12*	210	.12*
WBT	2	3400	780	.23	850	.25
WBR	d	1700	80	.05	210	.12
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.87		.80

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	200	.12*	140	.08
NBT	2	3400	420	.17	900	.29*
NBR	0	0	170		100	
SBL	1	1700	180	.11	190	.11*
SBT	2	3400	960	.32*	700	.23
SBR	0	0	141		89	
EBL	1	1700	92	.05	118	.07
EBT	2	3400	883	.26*	777	.23*
EBR	d	1700	110	.06	100	.06
WBL	1	1700	210	.12*	210	.12*
WBT	2	3400	782	.23	849	.25
WBR	d	1700	80	.05	210	.12
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.87		.80

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	200	.12*	140	.08
NBT	2	3400	420	.17	900	.29*
NBR	0	0	170		100	
SBL	1	1700	180	.11	190	.11*
SBT	2	3400	960	.32*	700	.23
SBR	0	0	139		86	
EBL	1	1700	91	.05	115	.07
EBT	2	3400	881	.26*	773	.23*
EBR	d	1700	110	.06	100	.06
WBL	1	1700	210	.12*	210	.12*
WBT	2	3400	779	.23	845	.25
WBR	d	1700	80	.05	210	.12
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.87		.80

36. Gothard St & Heil Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	160	.09*	290	.17*
NBT	2	3400	710	.21	790	.23
NBR	d	1700	200	.12	230	.14
SBL	1	1700	50	.03	120	.07
SBT	2	3400	590	.17*	640	.19*
SBR	d	1700	50	.03	120	.07
EBL	1	1700	130	.08	100	.06
EBT	2	3400	830	.24*	760	.22*
EBR	d	1700	190	.11	150	.09
WBL	1	1700	300	.18*	260	.15*
WBT	2	3400	510	.15	730	.21
WBR	d	1700	40	.02	80	.05
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.73		.78

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	160	.09*	290	.17*
NBT	2	3400	712	.21	788	.23
NBR	d	1700	200	.12	230	.14
SBL	1	1700	50	.03	120	.07
SBT	2	3400	594	.17*	636	.19*
SBR	d	1700	52	.03	118	.07
EBL	1	1700	131	.08	99	.06
EBT	2	3400	830	.24*	760	.22*
EBR	d	1700	190	.11	150	.09
WBL	1	1700	300	.18*	260	.15*
WBT	2	3400	510	.15	730	.21
WBR	d	1700	40	.02	80	.05
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.73		.78

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	160	.09*	290	.17*
NBT	2	3400	708	.21	783	.23
NBR	d	1700	200	.12	230	.14
SBL	1	1700	50	.03	120	.07
SBT	2	3400	592	.17*	630	.19*
SBR	d	1700	51	.03	115	.07
EBL	1	1700	129	.08	96	.06
EBT	2	3400	830	.24*	760	.22*
EBR	d	1700	190	.11	150	.09
WBL	1	1700	300	.18*	260	.15*
WBT	2	3400	510	.15	730	.21
WBR	d	1700	40	.02	80	.05
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.73		.78

37. Beach Blvd & Heil Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	160	.09*	220	.13*
NBT	4	6800	2460	.37	2770	.41
NBR	0	0	30		40	
SBL	1	1700	80	.05	160	.09
SBT	4	6800	2620	.44*	2630	.43*
SBR	0	0	350		280	
EBL	1	1700	180	.11*	310	.18*
EBT	2	3400	620	.18	480	.14
EBR	d	1700	240	.14	190	.11
WBL	1	1700	60	.04	60	.04
WBT	2	3400	380	.14*	430	.16*
WBR	0	0	90		120	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.83**		**.95**

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	160	.09*	220	.13*
NBT	4	6800	2463	.37	2768	.41
NBR	0	0	30		40	
SBL	1	1700	81	.05	159	.09
SBT	4	6800	2625	.44*	2625	.43*
SBR	0	0	350		280	
EBL	1	1700	180	.11*	310	.18*
EBT	2	3400	620	.18	480	.14
EBR	d	1700	240	.14	190	.11
WBL	1	1700	60	.04	60	.04
WBT	2	3400	380	.14*	430	.16*
WBR	0	0	90		120	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.83**		**.95**

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	160	.09*	220	.13*
NBT	4	6800	2458	.37	2762	.41
NBR	0	0	30		40	
SBL	1	1700	80	.05	158	.09
SBT	4	6800	2622	.44*	2619	.43*
SBR	0	0	350		280	
EBL	1	1700	180	.11*	310	.18*
EBT	2	3400	620	.18	480	.14
EBR	d	1700	240	.14	190	.11
WBL	1	1700	60	.04	60	.04
WBT	2	3400	380	.14*	430	.16*
WBR	0	0	90		120	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.83**		**.95**

38. Newland St & Heil Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	200	.12*	330	.19*
NBT	2	3400	490	.14	680	.20
NBR	d	1700	10	.01	20	.01
SBL	1	1700	50	.03	60	.04
SBT	2	3400	770	.23*	500	.15*
SBR	d	1700	220	.13	130	.08
EBL	1	1700	260	.15*	270	.16*
EBT	1	1700	70	.04	40	.02
EBR	1	1700	290	.17	130	.08
WBL	1	1700	10	.01	20	.01
WBT	1	1700	80	.08*	60	.08*
WBR	0	0	60		70	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.63**		**.63**

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	200	.12*	330	.19*
NBT	2	3400	490	.14	680	.20
NBR	d	1700	10	.01	20	.01
SBL	1	1700	50	.03	60	.04
SBT	2	3400	770	.23*	500	.15*
SBR	d	1700	220	.13	130	.08
EBL	1	1700	260	.15*	270	.16*
EBT	1	1700	70	.04	40	.02
EBR	1	1700	291	.17	129	.08
WBL	1	1700	10	.01	20	.01
WBT	1	1700	80	.08*	60	.08*
WBR	0	0	60		70	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.63**		**.63**

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	200	.12*	329	.19*
NBT	2	3400	490	.14	680	.20
NBR	d	1700	10	.01	20	.01
SBL	1	1700	50	.03	60	.04
SBT	2	3400	770	.23*	500	.15*
SBR	d	1700	220	.13	130	.08
EBL	1	1700	260	.15*	270	.16*
EBT	1	1700	70	.04	40	.02
EBR	1	1700	290	.17	129	.08
WBL	1	1700	10	.01	20	.01
WBT	1	1700	80	.08*	60	.08*
WBR	0	0	60		70	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.63**		**.63**

46. Gothard St & Warner Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	140	.08	260	.15
NBT	2	3400	590	.17*	860	.25*
NBR	d	1700	60	.04	80	.05
SBL	1	1700	130	.08*	160	.09*
SBT	2	3400	530	.16	480	.14
SBR	d	1700	80	.05	350	.21
EBL	1	1700	190	.11	240	.14*
EBT	3	5100	1510	.30*	1200	.24
EBR	1	1700	220	.13	310	.18
WBL	1	1700	90	.05*	140	.08
WBT	3	5100	760	.15	1580	.31*
WBR	d	1700	160	.09	260	.15
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.65**		**.84**

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	140	.08	260	.15
NBT	2	3400	591	.17*	859	.25*
NBR	d	1700	60	.04	80	.05
SBL	1	1700	130	.08*	160	.09*
SBT	2	3400	533	.16	477	.14
SBR	d	1700	81	.05	349	.21
EBL	1	1700	190	.11	240	.14*
EBT	3	5100	1510	.30*	1200	.24
EBR	1	1700	220	.13	310	.18
WBL	1	1700	90	.05*	140	.08
WBT	3	5100	760	.15	1580	.31*
WBR	d	1700	160	.09	260	.15
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.65**		**.84**

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	140	.08	260	.15
NBT	2	3400	589	.17*	855	.25*
NBR	d	1700	60	.04	80	.05
SBL	1	1700	130	.08*	160	.09*
SBT	2	3400	531	.16	474	.14
SBR	d	1700	80	.05	348	.20
EBL	1	1700	190	.11	240	.14*
EBT	3	5100	1510	.30*	1200	.24
EBR	1	1700	220	.13	310	.18
WBL	1	1700	90	.05*	140	.08
WBT	3	5100	760	.15	1580	.31*
WBR	d	1700	160	.09	259	.15
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.65**		**.84**

47. Beach Blvd & Warner Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	220	.06	380	.11
NBT	4	6800	1520	.26*	2450	.40*
NBR	0	0	220		270	
SBL	2	3400	300	.09*	290	.09*
SBT	4	6800	1840	.27	2110	.31
SBR	1	1700	340	.20	520	.31
EBL	2	3400	330	.10	440	.13*
EBT	3	5100	1160	.26*	1150	.28
EBR	0	0	170		260	
WBL	2	3400	410	.12*	320	.09
WBT	3	5100	750	.16	1190	.29*
WBR	0	0	70		290	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.78**		**.96**

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	220	.06	380	.11
NBT	4	6800	1522	.26*	2449	.40*
NBR	0	0	220		270	
SBL	2	3400	301	.09*	289	.09*
SBT	4	6800	1844	.27	2106	.31
SBR	1	1700	340	.20	520	.31
EBL	2	3400	330	.10	440	.13*
EBT	3	5100	1160	.26*	1150	.28
EBR	0	0	170		260	
WBL	2	3400	410	.12*	320	.09
WBT	3	5100	750	.16	1190	.29*
WBR	0	0	70		290	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.78**		**.96**

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	220	.06	380	.11
NBT	4	6800	1518	.26*	2444	.40*
NBR	0	0	220		270	
SBL	2	3400	300	.09*	288	.08*
SBT	4	6800	1842	.27	2101	.31
SBR	1	1700	340	.20	520	.31
EBL	2	3400	330	.10	439	.13*
EBT	3	5100	1160	.26*	1150	.28
EBR	0	0	170		260	
WBL	2	3400	410	.12*	320	.09
WBT	3	5100	750	.16	1190	.29*
WBR	0	0	70		289	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.78**		**.95**

48. Newland St & Warner Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07	150	.09
NBT	2	3400	530	.16*	870	.26*
NBR	d	1700	220	.13	170	.10
SBL	1	1700	270	.16*	180	.11*
SBT	2	3400	820	.24	540	.16
SBR	d	1700	360	.21	150	.09
EBL	1	1700	60	.04	130	.08*
EBT	3	5100	2000	.39*	1460	.29
EBR	d	1700	120	.07	110	.06
WBL	1	1700	200	.12*	310	.18
WBT	2	3400	890	.26	1440	.42*
WBR	1	1700	230	.14	360	.21
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .88 .92

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07	150	.09
NBT	2	3400	530	.16*	870	.26*
NBR	d	1700	220	.13	170	.10
SBL	1	1700	270	.16*	180	.11*
SBT	2	3400	820	.24	540	.16
SBR	d	1700	360	.21	150	.09
EBL	1	1700	60	.04	130	.08*
EBT	3	5100	2000	.39*	1460	.29
EBR	d	1700	120	.07	110	.06
WBL	1	1700	200	.12*	310	.18
WBT	2	3400	890	.26	1440	.42*
WBR	1	1700	230	.14	360	.21
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .88 .92

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	120	.07	149	.09
NBT	2	3400	530	.16*	870	.26*
NBR	d	1700	220	.13	170	.10
SBL	1	1700	270	.16*	180	.11*
SBT	2	3400	820	.24	540	.16
SBR	d	1700	360	.21	150	.09
EBL	1	1700	60	.04	130	.08*
EBT	3	5100	2000	.39*	1460	.29
EBR	d	1700	120	.07	109	.06
WBL	1	1700	200	.12*	310	.18
WBT	2	3400	890	.26	1440	.42*
WBR	1	1700	230	.14	360	.21
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .88 .92

250. Beach Blvd & McFadden Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	200	.06*	280	.08
NBT	4	6800	2240	.36	2780	.46*
NBR	0	0	200		330	
SBL	2	3400	240	.07	270	.08*
SBT	4	6800	2820	.47*	2530	.42
SBR	0	0	400		300	
EBL	2	3400	280	.08	400	.12*
EBT	2	3400	500	.19*	480	.18
EBR	0	0	140		140	
WBL	2	3400	460	.14*	480	.14
WBT	2	3400	530	.21	630	.24*
WBR	0	0	180		190	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .91 .95

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	200	.06*	280	.08
NBT	4	6800	2248	.36	2772	.46*
NBR	0	0	202		328	
SBL	2	3400	240	.07	270	.08*
SBT	4	6800	2824	.47*	2527	.42
SBR	0	0	400		300	
EBL	2	3400	281	.08	399	.12*
EBT	2	3400	501	.19*	479	.18
EBR	0	0	140		140	
WBL	2	3400	461	.14*	479	.14
WBT	2	3400	530	.21	630	.24*
WBR	0	0	180		190	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .91 .95

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	200	.06*	280	.08
NBT	4	6800	2243	.36	2761	.45*
NBR	0	0	201		325	
SBL	2	3400	240	.07	270	.08*
SBT	4	6800	2816	.47*	2516	.41
SBR	0	0	400		299	
EBL	2	3400	280	.08	398	.12*
EBT	2	3400	500	.19*	478	.18
EBR	0	0	140		140	
WBL	2	3400	459	.14*	477	.14
WBT	2	3400	530	.21	629	.24*
WBR	0	0	180		190	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .91 .94

251. Beach Blvd & Bolsa Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	280	.08*	310	.09
NBT	4	6800	2260	.33	2990	.45*
NBR	0	0	10		40	
SBL	2	3400	160	.05	240	.07*
SBT	4	6800	2820	.46*	2600	.42
SBR	0	0	290		250	
EBL	1	1700	230	.14*	410	.24*
EBT	2	3400	620	.18	680	.20
EBR	1	1700	560	.33	460	.27
WBL	1	1700	140	.08	180	.11
WBT	2	3400	610	.18*	860	.25*
WBR	1	1700	190	.11	260	.15
Right Turn Adjustment			EBR	.05*		
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .96 1.06

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	280	.08*	310	.09
NBT	4	6800	2266	.34	2984	.44*
NBR	0	0	12		38	
SBL	2	3400	160	.05	240	.07*
SBT	4	6800	2823	.46*	2598	.42
SBR	0	0	290		250	
EBL	1	1700	230	.14*	410	.24*
EBT	2	3400	620	.18	680	.20
EBR	1	1700	560	.33	460	.27
WBL	1	1700	141	.08	179	.11
WBT	2	3400	610	.18*	860	.25*
WBR	1	1700	190	.11	260	.15
Right Turn Adjustment			EBR	.05*		
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .96 1.05

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	280	.08*	310	.09
NBT	4	6800	2262	.33	2978	.44*
NBR	0	0	11		36	
SBL	2	3400	160	.05	240	.07*
SBT	4	6800	2818	.46*	2591	.42
SBR	0	0	290		250	
EBL	1	1700	230	.14*	410	.24*
EBT	2	3400	620	.18	680	.20
EBR	1	1700	560	.33	460	.27
WBL	1	1700	139	.08	177	.10
WBT	2	3400	610	.18*	860	.25*
WBR	1	1700	190	.11	260	.15
Right Turn Adjustment			EBR	.05*		
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .96 1.05

252. Beach Blvd & Hazard Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	130	.08*	130	.08
NBT	4	6800	2500	.37	3480	.52*
NBR	0	0	30		80	
SBL	1	1700	110	.06	140	.08*
SBT	4	6800	3610	.53*	2410	.35
SBR	d	1700	80	.05	60	.04
EBL	1	1700	50	.03	120	.07*
EBT	2	3400	290	.09*	450	.13
EBR	1	1700	130	.08	60	.04
WBL	1	1700	80	.05*	80	.05
WBT	2	3400	370	.11	360	.11*
WBR	d	1700	180	.11	200	.12
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .80 .83

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	130	.08*	130	.08
NBT	4	6800	2504	.37	3476	.52*
NBR	0	0	31		79	
SBL	1	1700	110	.06	140	.08*
SBT	4	6800	3612	.53*	2409	.35
SBR	d	1700	80	.05	60	.04
EBL	1	1700	50	.03	120	.07*
EBT	2	3400	290	.09*	450	.13
EBR	1	1700	130	.08	60	.04
WBL	1	1700	81	.05*	80	.05
WBT	2	3400	370	.11	360	.11*
WBR	d	1700	180	.11	200	.12
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .80 .83

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	130	.08*	130	.08
NBT	4	6800	2501	.37	3472	.52*
NBR	0	0	30		78	
SBL	1	1700	110	.06	140	.08*
SBT	4	6800	3608	.53*	2404	.35
SBR	d	1700	80	.05	60	.04
EBL	1	1700	50	.03	120	.07*
EBT	2	3400	290	.09*	450	.13
EBR	1	1700	130	.08	60	.04
WBL	1	1700	80	.05*	78	.05
WBT	2	3400	370	.11	360	.11*
WBR	d	1700	180	.11	200	.12
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .80 .83

253. Magnolia St & Edinger Ave

2030 General Plan

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	220	.13*	210	.12
NBT	3	5100	790	.18	1360	.30*
NBR	0	0	130		150	
SBL	1	1700	240	.14	160	.09*
SBT	3	5100	1930	.38*	860	.17
SBR	d	1700	100	.06	120	.07
EBL	1	1700	70	.04	120	.07*
EBT	2	3400	860	.25*	670	.20
EBR	d	1700	310	.18	170	.10
WBL	1	1700	120	.07*	90	.05
WBT	2	3400	670	.20	930	.27*
WBR	d	1700	90	.05	190	.11
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.88**		**.78**

2030 With-Project Proposed GPA Option 2

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	220	.13*	210	.12
NBT	3	5100	790	.18	1360	.30*
NBR	0	0	130		150	
SBL	1	1700	240	.14	160	.09*
SBT	3	5100	1930	.38*	860	.17
SBR	d	1700	100	.06	120	.07
EBL	1	1700	70	.04	120	.07*
EBT	2	3400	862	.25*	668	.20
EBR	d	1700	310	.18	170	.10
WBL	1	1700	120	.07*	90	.05
WBT	2	3400	671	.20	929	.27*
WBR	d	1700	90	.05	190	.11
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.88**		**.78**

2030 With-Project Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	220	.13*	210	.12
NBT	3	5100	790	.18	1360	.30*
NBR	0	0	130		150	
SBL	1	1700	240	.14	160	.09*
SBT	3	5100	1930	.38*	860	.17
SBR	d	1700	100	.06	120	.07
EBL	1	1700	70	.04	120	.07*
EBT	2	3400	861	.25*	665	.20
EBR	d	1700	310	.18	170	.10
WBL	1	1700	120	.07*	90	.05
WBT	2	3400	669	.20	927	.27*
WBR	d	1700	90	.05	190	.11
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.88**		**.78**

MITIGATION MEASURES AND DRIVEWAYS

1. Sher Ln & Edinger Av

2030 - Proposed GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	34		72	
NBT	1	1700	21	.11*	53	.13*
NBR	0	0	134		91	
SBL	0	0	15	{.01}*	175	{.10}*
SBT	1	1700	14	.02	35	.12
SBR	1	1700	21	.01	150	.09
EBL	2	3400	34	.01	215	.06*
EBT	3	5100	1004	.21*	1072	.22
EBR	0	0	50		49	
WBL	1	1700	36	.02*	120	.07
WBT	3	5100	1004	.20	1200	.27*
WBR	0	0	40		167	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .40 .61

2030 - Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	34		72	
NBT	1	1700	21	.11*	53	.13*
NBR	0	0	134		91	
SBL	0	0	15	{.01}*	175	{.10}*
SBT	1	1700	14	.02	35	.12
SBR	1	1700	21	.01	175	.10
EBL	2	3400	34	.01	215	.06*
EBT	3	5100	1013	.21*	1080	.22
EBR	0	0	50		49	
WBL	1	1700	36	.02*	120	.07
WBT	3	5100	1011	.21	1207	.27*
WBR	0	0	40		167	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .40 .61

2. Parkside Ln & Edinger Av

2030 - Proposed GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	37	.02*	90	.05*
NBT	1	1700	12	.01	24	.01
NBR	1	1700	93	.05	104	.06
SBL	0	0	66		311	
SBT	1	1700	6	.04*	35	.20*
SBR	1	1700	13	.01	94	.06
EBL	2	3400	33	.01	84	.02
EBT	3	5100	992	.21*	1174	.25*
EBR	0	0	65		80	
WBL	1	1700	56	.03*	130	.08*
WBT	3	5100	863	.17	1210	.24
WBR	1	1700	132	.08	400	.24
Right Turn Adjustment			NBR	.01*		
Clearance Interval				.05*		.05*
Note: Assumes N/S Split Phasing						

TOTAL CAPACITY UTILIZATION .36 .63

2030 - Alternative GPA

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	37	.02*	90	.05*
NBT	1	1700	12	.01	24	.01
NBR	1	1700	93	.05	104	.06
SBL	0	0	66		311	
SBT	1	1700	6	.04*	35	.20*
SBR	1	1700	13	.01	94	.06
EBL	2	3400	33	.01	84	.02
EBT	3	5100	998	.21*	1174	.25*
EBR	0	0	65		80	
WBL	1	1700	56	.03*	130	.08*
WBT	3	5100	870	.17	1210	.24
WBR	1	1700	132	.08	400	.24
Right Turn Adjustment			NBR	.01*		
Clearance Interval				.05*		.05*
Note: Assumes N/S Split Phasing						

TOTAL CAPACITY UTILIZATION .36 .63

28. Beach Blvd & Edinger Ave

2014 Prop. GPA OP2 w/only 4th NBT added

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	143	.04*	594	.17*
NBT	4	6800	1800	.26	2400	.35
NBR	1	1700	390	.23	580	.34
SBL	2	3400	550	.16	391	.12
SBT	4	6800	2655	.39*	2375	.35*
SBR	2	3400	358	.11	810	.24
EBL	2	3400	211	.06	423	.12*
EBT	3	5100	743	.15*	775	.15
EBR	1	1700	137	.08	318	.19
WBL	2	3400	110	.03*	210	.06
WBT	2	3400	410	.12	649	.19*
WBR	1	1700	310	.18	280	.16
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .66 .88

2014 Alt. GPA w/only 4th NBT added

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	136	.04*	586	.17*
NBT	4	6800	1800	.26	2400	.35
NBR	1	1700	390	.23	580	.34
SBL	2	3400	549	.16	388	.11
SBT	4	6800	2654	.39*	2374	.35*
SBR	2	3400	349	.10	798	.23
EBL	2	3400	206	.06*	413	.12*
EBT	3	5100	738	.14	765	.15
EBR	1	1700	134	.08	312	.18
WBL	2	3400	110	.03	210	.06
WBT	2	3400	405	.12*	642	.19*
WBR	1	1700	310	.18	280	.16
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .66 .88

2014 Prop. GPA OP2 w/only 3rd WBT added

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	143	.04	594	.17
NBT	3	5100	1800	.35*	2400	.47*
NBR	1	1700	390	.23	580	.34
SBL	2	3400	550	.16*	391	.12*
SBT	4	6800	2655	.39	2375	.35
SBR	2	3400	358	.11	810	.24
EBL	2	3400	211	.06	423	.12*
EBT	3	5100	743	.15*	775	.15
EBR	1	1700	137	.08	318	.19
WBL	2	3400	110	.03*	210	.06
WBT	3	5100	410	.08	649	.13*
WBR	1	1700	310	.18	280	.16
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .74 .89

2014 Alt. GPA w/only 3rd WBT added

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	136	.04	586	.17
NBT	3	5100	1800	.35*	2400	.47*
NBR	1	1700	390	.23	580	.34
SBL	2	3400	549	.16*	388	.11*
SBT	4	6800	2654	.39	2374	.35
SBR	2	3400	349	.10	798	.23
EBL	2	3400	206	.06	413	.12*
EBT	3	5100	738	.14*	765	.15
EBR	1	1700	134	.08	312	.18
WBL	2	3400	110	.03*	210	.06
WBT	3	5100	405	.08	642	.13*
WBR	1	1700	310	.18	280	.16
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .73 .88

28. Beach Blvd & Edinger Ave

2030 Prop. GPA OP2 w/only 4th NBT added

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	143	.04	568	.17*
NBT	4	6800	2070	.30*	2670	.39
NBR	1	1700	400	.24	630	.37
SBL	2	3400	673	.20*	437	.13
SBT	4	6800	2821	.41	2449	.36*
SBR	2	3400	445	.13	936	.28
EBL	2	3400	208	.06*	482	.14*
EBT	3	5100	819	.16	801	.16
EBR	1	1700	124	.07	306	.18
WBL	2	3400	120	.04	220	.06
WBT	2	3400	463	.14*	708	.21*
WBR	1	1700	320	.19	300	.18
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .75 .93

2030 Alt. GPA w/only 4th NBT added

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	137	.04	559	.16*
NBT	4	6800	2070	.30*	2670	.39
NBR	1	1700	400	.24	630	.37
SBL	2	3400	671	.20*	434	.13
SBT	4	6800	2821	.41	2447	.36*
SBR	2	3400	436	.13	924	.27
EBL	2	3400	203	.06	472	.14*
EBT	3	5100	814	.16*	790	.15
EBR	1	1700	122	.07	300	.18
WBL	2	3400	120	.04*	220	.06
WBT	2	3400	458	.13	701	.21*
WBR	1	1700	320	.19	300	.18
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .75 .92

2030 Prop. GPA OP2 w/only 3rd WBT added

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	143	.04	568	.17
NBT	3	5100	2070	.41*	2670	.52*
NBR	1	1700	400	.24	630	.37
SBL	2	3400	673	.20*	437	.13*
SBT	4	6800	2821	.41	2449	.36
SBR	2	3400	445	.13	936	.28
EBL	2	3400	208	.06	482	.14*
EBT	3	5100	819	.16*	801	.16
EBR	1	1700	124	.07	306	.18
WBL	2	3400	120	.04*	220	.06
WBT	3	5100	463	.09	708	.14*
WBR	1	1700	320	.19	300	.18
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .86 .98

2030 Alt. GPA w/only 3rd WBT added

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	137	.04	559	.16
NBT	3	5100	2070	.41*	2670	.52*
NBR	1	1700	400	.24	630	.37
SBL	2	3400	671	.20*	434	.13*
SBT	4	6800	2821	.41	2447	.36
SBR	2	3400	436	.13	924	.27
EBL	2	3400	203	.06	472	.14*
EBT	3	5100	814	.16*	790	.15
EBR	1	1700	122	.07	300	.18
WBL	2	3400	120	.04*	220	.06
WBT	3	5100	458	.09	701	.14*
WBR	1	1700	320	.19	300	.18
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .86 .98

28. Beach Blvd & Edinger Ave

Existing with committed lanes

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	130	.04	550	.16
NBT	3	5100	1690	.33*	2290	.45*
NBR	1	1700	390	.23	560	.33
SBL	2	3400	490	.14*	360	.11*
SBT	4	6800	2570	.38	2340	.34
SBR	2	3400	300	.09	680	.20
EBL	2	3400	170	.05*	350	.10*
EBT	3	5100	670	.13	710	.14
EBR	1	1700	120	.07	290	.17
WBL	2	3400	100	.03	200	.06
WBT	2	3400	370	.11*	580	.17*
WBR	1	1700	300	.18	270	.16
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .68 .88

2014 With-Proj. Prop. GPA Option 2 w/mitigation

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	143	.04*	594	.17*
NBT	4	6800	1800	.26	2400	.35
NBR	1	1700	390	.23	580	.34
SBL	2	3400	550	.16	391	.12
SBT	4	6800	2655	.39*	2375	.35*
SBR	2	3400	358	.11	810	.24
EBL	2	3400	211	.06	423	.12*
EBT	3	5100	743	.15*	775	.15
EBR	1	1700	137	.08	318	.19
WBL	2	3400	110	.03*	210	.06
WBT	3	5100	410	.08	649	.13*
WBR	1	1700	310	.18	280	.16
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .66 .82

2014 With-Project Alt. GPA with mitigation

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	136	.04*	586	.17*
NBT	4	6800	1800	.26	2400	.35
NBR	1	1700	390	.23	580	.34
SBL	2	3400	549	.16	388	.11
SBT	4	6800	2654	.39*	2374	.35*
SBR	2	3400	349	.10	798	.23
EBL	2	3400	206	.06	413	.12*
EBT	3	5100	738	.14*	765	.15
EBR	1	1700	134	.08	312	.18
WBL	2	3400	110	.03*	210	.06
WBT	3	5100	405	.08	642	.13*
WBR	1	1700	310	.18	280	.16
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .65 .82

2030 With-Proj. Prop. GPA Option 2 w/mitigation

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	143	.04	568	.17*
NBT	4	6800	2070	.30*	2670	.39
NBR	1	1700	400	.24	630	.37
SBL	2	3400	673	.20*	437	.13
SBT	4	6800	2821	.41	2449	.36*
SBR	2	3400	445	.13	936	.28
EBL	2	3400	208	.06	482	.14*
EBT	3	5100	819	.16*	801	.16
EBR	1	1700	124	.07	306	.18
WBL	2	3400	120	.04*	220	.06
WBT	3	5100	463	.09	708	.14*
WBR	1	1700	320	.19	300	.18
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .75 .86

28. Beach Blvd & Edinger Ave

2030 With-Project Alt. GPA with mitigation

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	137	.04	559	.16*
NBT	4	6800	2070	.30*	2670	.39
NBR	1	1700	400	.24	630	.37
SBL	2	3400	671	.20*	434	.13
SBT	4	6800	2821	.41	2447	.36*
SBR	2	3400	436	.13	924	.27
EBL	2	3400	203	.06	472	.14*
EBT	3	5100	814	.16*	790	.15
EBR	1	1700	122	.07	300	.18
WBL	2	3400	120	.04*	220	.06
WBT	3	5100	458	.09	701	.14*
WBR	1	1700	320	.19	300	.18
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.75		.85

2. Huntington Village LN (DWY2) & Center Ave

2030 With-Project Proposed GPA Option 2 (Dwy)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	30	.02	50	.03
NBT	1	1700	10	.04*	20	.06*
NBR	0	0	60		90	
SBL	1	1700	20	.01*	100	.06*
SBT	1	1700	10	.02	20	.06
SBR	0	0	20		80	
EBL	1	1700	10	.01	50	.03*
EBT	3	5100	280	.06*	160	.04
EBR	0	0	30		60	
WBL	1	1700	40	.02*	100	.06
WBT	3	5100	300	.06	360	.08*
WBR	0	0	20		30	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.18		.28

3. Citibank/Denny's Signal (DWY3) & Edinger Ave

2030 With-Project Proposed GPA Option 2 (Dwy)

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	40	.02*	80	.05*
NBT	1	1700	10	.01	10	.02
NBR	0	0	10		30	
SBL	1.5		50		80	
SBT	0.5	3400	10	.02*	10	.03*
SBR	1	1700	110	.06	190	.11
EBL	1	1700	70	.04*	190	.11*
EBT	3	5100	1130	.23	1250	.26
EBR	0	0	30		100	
WBL	1	1700	20	.01	60	.04
WBT	3	5100	1170	.24*	1410	.31*
WBR	0	0	70		160	
Right Turn Adjustment			SBR	.02*	SBR	.02*
Clearance Interval				.05*		.05*
Note: Assumes N/S Split Phasing						
TOTAL CAPACITY UTILIZATION				.39		.57

2. Huntington Village LN (DWY2) & Center Ave

2030 With-Project Alternative GPA (Driveway)

			AM PK HOUR		PM PK HOUR	
	LANES	CAPACITY	VOL	V/C	VOL	V/C
NBL	1	1700	20	.01	50	.03
NBT	1	1700	10	.04*	20	.05*
NBR	0	0	50		70	
SBL	1	1700	20	.01*	100	.06*
SBT	1	1700	10	.02	20	.06
SBR	0	0	20		80	
EBL	1	1700	10	.01	50	.03*
EBT	3	5100	270	.06*	120	.04
EBR	0	0	20		60	
WBL	1	1700	30	.02*	80	.05
WBT	3	5100	280	.06	360	.08*
WBR	0	0	20		30	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION **.18** **.27**

3. Citibank/Denny's Signal (DWY3) & Edinger Ave

2030 With-Project Alternative GPA (Driveway)

			AM PK HOUR		PM PK HOUR	
	LANES	CAPACITY	VOL	V/C	VOL	V/C
NBL	1	1700	40	.02*	80	.05*
NBT	1	1700	10	.01	10	.02
NBR	0	0	10		30	
SBL	1.5		80		100	
SBT	0.5	3400	10	.03*	10	.03*
SBR	1	1700	60	.04	120	.07
EBL	1	1700	60	.04*	170	.10*
EBT	3	5100	1160	.23	1250	.26
EBR	0	0	30		100	
WBL	1	1700	20	.01	60	.04
WBT	3	5100	1210	.25*	1440	.31*
WBR	0	0	50		130	
Clearance Interval				.05*		.05*

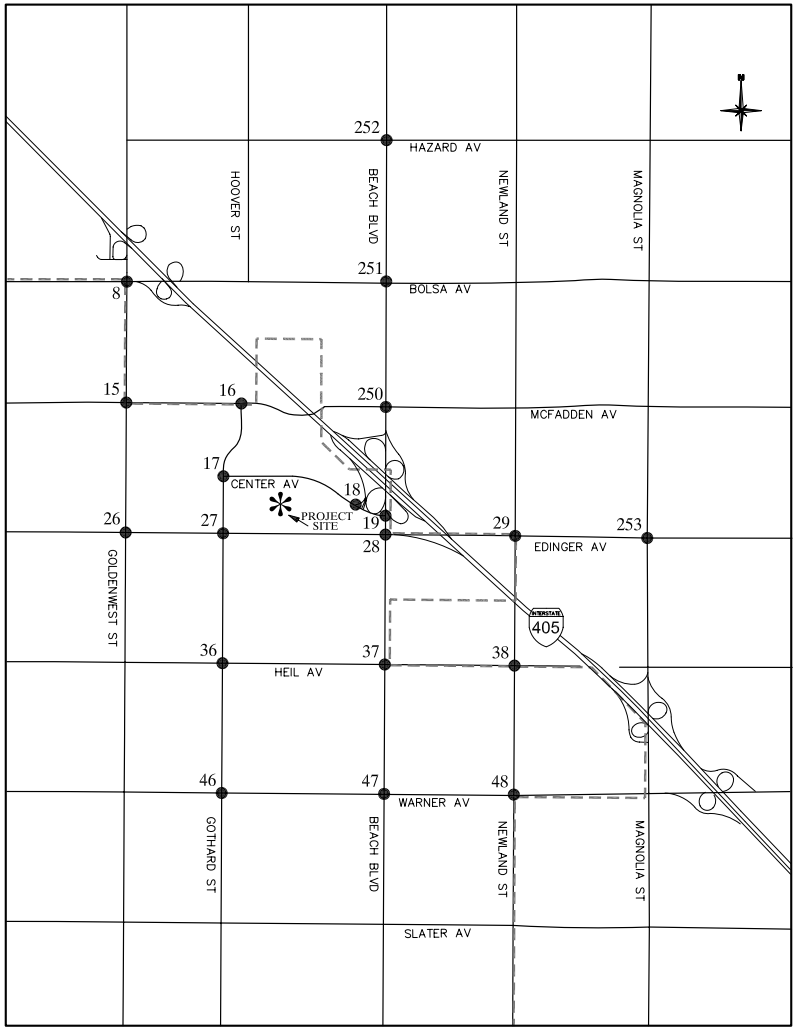
Note: Assumes N/S Split Phasing

TOTAL CAPACITY UTILIZATION **.39** **.54**

Appendix C

HCM INTERSECTION CALCULATIONS

C-1 Intersection Location Map



Legend

City Limits

Figure C-1

INTERSECTION LOCATION MAP

Existing - AM Peak Hour
18: Center & I-405 SB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	50	90	260	310	800	150
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	90	260	310	800	150
RTOR Reduction (vph)	0	0	0	136	0	109
Lane Group Flow (vph)	50	90	260	174	800	41
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	7.5	79.0	67.5	67.5	33.0	33.0
Effective Green, g (s)	7.5	79.0	67.5	67.5	33.0	33.0
Actuated g/C Ratio	0.06	0.66	0.56	0.56	0.28	0.28
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	111	2330	1991	890	944	435
v/s Ratio Prot	c0.03	0.03	0.07		c0.23	
v/s Ratio Perm				c0.11		0.03
v/c Ratio	0.45	0.04	0.13	0.20	0.85	0.09
Uniform Delay, d1	54.3	7.2	12.4	12.9	41.1	32.4
Progression Factor	1.00	1.00	0.77	0.42	1.00	1.00
Incremental Delay, d2	2.9	0.0	0.1	0.5	7.1	0.1
Delay (s)	57.2	7.2	9.6	5.9	48.3	32.5
Level of Service	E	A	A	A	D	C
Approach Delay (s)		25.1	7.6		45.8	
Approach LOS		C	A		D	

Intersection Summary

HCM Average Control Delay	30.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.88		0.86	0.86	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3433	2787		6408	6408	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3433	2787		6408	6408	1583
Volume (vph)	80	830	0	2210	2550	520
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	80	830	0	2210	2550	520
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	80	829	0	2210	2550	520
Turn Type		Perm				Free
Protected Phases	4			2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	52.0	52.0		60.0	60.0	120.0
Effective Green, g (s)	52.0	52.0		60.0	60.0	120.0
Actuated g/C Ratio	0.43	0.43		0.50	0.50	1.00
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1488	1208		3204	3204	1583
v/s Ratio Prot	0.02			0.34	c0.40	
v/s Ratio Perm		c0.30				0.33
v/c Ratio	0.05	0.69		0.69	0.80	0.33
Uniform Delay, d1	19.7	27.4		22.9	24.9	0.0
Progression Factor	0.21	0.20		0.27	0.55	1.00
Incremental Delay, d2	0.0	1.1		0.7	1.4	0.4
Delay (s)	4.2	6.5		6.9	15.1	0.4
Level of Service	A	A		A	B	A
Approach Delay (s)	6.3			6.9	12.6	
Approach LOS	A			A	B	

Intersection Summary

HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	*0.30	1.00	1.00	0.95	1.00	0.97	*0.70	1.00	*1.00	0.86	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1676	1583	1770	3539	1583	3433	3912	1583	3539	6408	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1676	1583	1770	3539	1583	3433	3912	1583	3539	6408	2787
Volume (vph)	170	670	120	100	370	300	130	1690	390	490	2570	300
Peak-hour factor, PHF	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. Flow (vph)	170	670	120	100	370	300	130	1690	390	490	2570	300
RTOR Reduction (vph)	0	0	44	0	0	171	0	0	109	0	0	133
Lane Group Flow (vph)	170	670	76	100	370	129	130	1690	281	490	2570	167
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	19.6	31.0	31.0	7.0	18.4	18.4	8.0	50.0	50.0	16.0	58.0	58.0
Effective Green, g (s)	19.6	31.0	31.0	7.0	18.4	18.4	8.0	50.0	50.0	16.0	58.0	58.0
Actuated g/C Ratio	0.16	0.26	0.26	0.06	0.15	0.15	0.07	0.42	0.42	0.13	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	561	433	409	103	543	243	229	1630	660	472	3097	1347
v/s Ratio Prot	0.05	c0.40		c0.06	0.10		0.04	c0.43		c0.14	0.40	
v/s Ratio Perm			0.05			0.08			0.18			0.06
v/c Ratio	0.30	1.55	0.19	0.97	0.68	0.53	0.57	1.04	0.43	1.04	0.83	0.12
Uniform Delay, d1	44.2	44.5	34.7	56.4	48.0	46.8	54.3	35.0	24.8	52.0	26.7	17.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.60	0.46	0.31	0.78	0.43	0.07
Incremental Delay, d2	0.3	257.5	1.0	79.0	3.5	2.2	2.5	30.0	1.6	43.3	1.8	0.1
Delay (s)	44.5	302.0	35.7	135.4	51.5	49.0	35.1	46.3	9.3	84.0	13.3	1.3
Level of Service	D	F	D	F	D	D	D	D	A	F	B	A
Approach Delay (s)		223.1			61.5			39.1			22.5	
Approach LOS		F			E			D			C	

Intersection Summary

HCM Average Control Delay	58.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.86		1.00	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	1863	1583	1770	6399		1770	6344	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	1863	1583	1770	6399		1770	6344	
Volume (vph)	90	900	100	50	240	80	150	2080	20	70	2540	180
Peak-hour factor, PHF	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. Flow (vph)	90	900	100	50	240	80	150	2080	20	70	2540	180
RTOR Reduction (vph)	0	0	70	0	0	63	0	1	0	0	9	0
Lane Group Flow (vph)	90	900	30	50	240	17	150	2099	0	70	2711	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	10.4	32.0	32.0	4.0	25.6	25.6	11.9	60.3		7.7	56.1	
Effective Green, g (s)	10.4	32.0	32.0	4.0	25.6	25.6	11.9	60.3		7.7	56.1	
Actuated g/C Ratio	0.09	0.27	0.27	0.03	0.21	0.21	0.10	0.50		0.06	0.47	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	153	944	422	59	397	338	176	3215		114	2966	
v/s Ratio Prot	0.05	c0.25		c0.03	0.13		c0.08	0.33		0.04	c0.43	
v/s Ratio Perm			0.02			0.01						
v/c Ratio	0.59	0.95	0.07	0.85	0.60	0.05	0.85	0.65		0.61	0.91	
Uniform Delay, d1	52.7	43.3	32.9	57.7	42.6	37.5	53.2	22.1		54.7	29.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.58	0.09		1.33	0.31	
Incremental Delay, d2	5.7	18.9	0.1	64.8	2.6	0.1	18.1	0.5		5.4	3.3	
Delay (s)	58.4	62.1	33.0	122.5	45.2	37.6	102.3	2.5		78.2	12.6	
Level of Service	E	E	C	F	D	D	F	A		E	B	
Approach Delay (s)		59.2			54.0			9.2			14.2	
Approach LOS		E			D			A			B	

Intersection Summary

HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.86		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	6389		1770	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1770	6389		1770	6408	1583
Volume (vph)	290	1160	160	250	700	60	130	2000	40	260	1830	240
Peak-hour factor, PHF	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. Flow (vph)	290	1160	160	250	700	60	130	2000	40	260	1830	240
RTOR Reduction (vph)	0	0	120	0	0	48	0	2	0	0	0	144
Lane Group Flow (vph)	290	1160	40	250	700	12	130	2038	0	260	1830	96
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	16.0	30.0	30.0	10.0	24.0	24.0	16.0	43.0		21.0	48.0	48.0
Effective Green, g (s)	16.0	30.0	30.0	10.0	24.0	24.0	16.0	43.0		21.0	48.0	48.0
Actuated g/C Ratio	0.13	0.25	0.25	0.08	0.20	0.20	0.13	0.36		0.18	0.40	0.40
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	458	1271	396	286	1017	317	236	2289		310	2563	633
v/s Ratio Prot	0.08	c0.23		c0.07	0.14		0.07	c0.32		c0.15	0.29	
v/s Ratio Perm			0.03			0.01						0.06
v/c Ratio	0.63	0.91	0.10	0.87	0.69	0.04	0.55	0.89		0.84	0.71	0.15
Uniform Delay, d1	49.2	43.7	34.6	54.4	44.5	38.7	48.6	36.3		47.9	30.2	23.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.11	1.37	4.69
Incremental Delay, d2	6.5	11.5	0.5	28.9	3.8	0.2	9.0	5.7		12.0	0.8	0.2
Delay (s)	55.7	55.2	35.1	83.3	48.3	38.9	57.6	42.0		65.0	42.2	108.1
Level of Service	E	E	D	F	D	D	E	D		E	D	F
Approach Delay (s)		53.3			56.4			42.9			51.5	
Approach LOS		D			E			D			D	

Intersection Summary

HCM Average Control Delay	50.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.86		0.97	0.86	
Frt	1.00	0.96		1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3401		3433	3408		3433	6348		3433	6309	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3401		3433	3408		3433	6348		3433	6309	
Volume (vph)	270	370	130	350	520	170	190	1800	120	200	2360	270
Peak-hour factor, PHF	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. Flow (vph)	270	370	130	350	520	170	190	1800	120	200	2360	270
RTOR Reduction (vph)	0	30	0	0	27	0	0	8	0	0	16	0
Lane Group Flow (vph)	270	470	0	350	663	0	190	1912	0	200	2614	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.8	23.2		14.7	26.1		9.0	54.9		11.2	57.1	
Effective Green, g (s)	11.8	23.2		14.7	26.1		9.0	54.9		11.2	57.1	
Actuated g/C Ratio	0.10	0.19		0.12	0.22		0.08	0.46		0.09	0.48	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	338	658		421	741		257	2904		320	3002	
v/s Ratio Prot	0.08	0.14		c0.10	c0.19		c0.06	0.30		0.06	c0.41	
v/s Ratio Perm												
v/c Ratio	0.80	0.71		0.83	0.90		0.74	0.66		0.62	0.87	
Uniform Delay, d1	52.9	45.3		51.4	45.6		54.4	25.3		52.4	28.1	
Progression Factor	1.00	1.00		1.00	1.00		0.82	1.36		1.34	0.32	
Incremental Delay, d2	12.4	3.7		13.1	13.3		8.5	0.9		1.7	1.8	
Delay (s)	65.3	49.0		64.5	59.0		53.1	35.4		72.0	10.9	
Level of Service	E	D		E	E		D	D		E	B	
Approach Delay (s)		54.7			60.8			37.0			15.2	
Approach LOS		D			E			D			B	

Intersection Summary

HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.86		0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	6403		3433	6347	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	6403		3433	6347	
Volume (vph)	170	480	490	130	560	180	270	1960	10	150	2210	150
Peak-hour factor, PHF	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. Flow (vph)	170	480	490	130	560	180	270	1960	10	150	2210	150
RTOR Reduction (vph)	0	0	127	0	0	134	0	1	0	0	8	0
Lane Group Flow (vph)	170	480	363	130	560	46	270	1969	0	150	2352	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	14.2	30.2	30.2	10.8	26.8	26.8	11.7	54.2		8.8	51.3	
Effective Green, g (s)	14.2	30.2	30.2	10.8	26.8	26.8	11.7	54.2		8.8	51.3	
Actuated g/C Ratio	0.12	0.25	0.25	0.09	0.22	0.22	0.10	0.45		0.07	0.43	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	209	891	398	159	790	354	335	2892		252	2713	
v/s Ratio Prot	c0.10	0.14		0.07	0.16		c0.08	c0.31		0.04	c0.37	
v/s Ratio Perm			c0.23			0.03						
v/c Ratio	0.81	0.54	0.91	0.82	0.71	0.13	0.81	0.68		0.60	0.87	
Uniform Delay, d1	51.6	38.9	43.6	53.6	43.0	37.3	53.0	26.1		53.9	31.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.09	0.82		1.00	1.00	
Incremental Delay, d2	20.9	0.6	24.6	26.7	2.9	0.2	9.7	0.9		3.7	4.0	
Delay (s)	72.5	39.5	68.2	80.3	45.9	37.4	67.7	22.3		57.6	35.3	
Level of Service	E	D	E	F	D	D	E	C		E	D	
Approach Delay (s)		56.8			49.3			27.8			36.6	
Approach LOS		E			D			C			D	

Intersection Summary

HCM Average Control Delay	38.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.86		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	6395		1770	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	6395		1770	6408	1583
Volume (vph)	50	270	100	80	340	170	90	2210	30	100	2810	80
Peak-hour factor, PHF	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. Flow (vph)	50	270	100	80	340	170	90	2210	30	100	2810	80
RTOR Reduction (vph)	0	0	87	0	0	144	0	1	0	0	0	30
Lane Group Flow (vph)	50	270	13	80	340	26	90	2239	0	100	2810	50
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	5.5	13.5	13.5	7.6	15.6	15.6	7.8	58.3		8.3	58.8	58.8
Effective Green, g (s)	5.5	13.5	13.5	7.6	15.6	15.6	7.8	58.3		8.3	58.8	58.8
Actuated g/C Ratio	0.05	0.13	0.13	0.07	0.15	0.15	0.08	0.56		0.08	0.57	0.57
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	94	461	206	130	532	238	133	3595		142	3633	898
v/s Ratio Prot	0.03	0.08		c0.05	c0.10		0.05	0.35		c0.06	c0.44	
v/s Ratio Perm			0.01			0.02						0.03
v/c Ratio	0.53	0.59	0.06	0.62	0.64	0.11	0.68	0.62		0.70	0.77	0.06
Uniform Delay, d1	47.8	42.5	39.6	46.6	41.4	38.0	46.7	15.3		46.5	17.3	10.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.7	1.9	0.1	8.4	2.5	0.2	12.8	0.3		14.7	1.1	0.0
Delay (s)	53.5	44.4	39.7	55.0	43.9	38.2	59.5	15.6		61.2	18.4	10.1
Level of Service	D	D	D	D	D	D	E	B		E	B	B
Approach Delay (s)		44.3			43.8			17.3			19.6	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	22.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	103.7	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	350	210	240	610	930	200
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	350	210	240	610	930	200
RTOR Reduction (vph)	0	0	0	387	0	139
Lane Group Flow (vph)	350	210	240	223	930	61
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	27.3	75.2	43.9	43.9	36.8	36.8
Effective Green, g (s)	27.3	75.2	43.9	43.9	36.8	36.8
Actuated g/C Ratio	0.23	0.63	0.37	0.37	0.31	0.31
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	403	2218	1295	579	1053	485
v/s Ratio Prot	c0.20	0.06	0.07		c0.27	
v/s Ratio Perm				c0.14		0.04
v/c Ratio	0.87	0.09	0.19	0.39	0.88	0.13
Uniform Delay, d1	44.6	8.9	25.9	28.1	39.6	30.0
Progression Factor	1.00	1.00	0.72	0.49	1.00	1.00
Incremental Delay, d2	17.6	0.1	0.3	1.7	8.9	0.1
Delay (s)	62.3	9.0	19.0	15.5	48.5	30.1
Level of Service	E	A	B	B	D	C
Approach Delay (s)		42.3	16.5		45.2	
Approach LOS		D	B		D	

Intersection Summary

HCM Average Control Delay	35.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.88		0.86	0.86	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3433	2787		6408	6408	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3433	2787		6408	6408	1583
Volume (vph)	160	960	0	3160	2420	820
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	960	0	3160	2420	820
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	160	957	0	3160	2420	820
Turn Type		Perm				Free
Protected Phases	4			2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	44.4	44.4		67.6	67.6	120.0
Effective Green, g (s)	44.4	44.4		67.6	67.6	120.0
Actuated g/C Ratio	0.37	0.37		0.56	0.56	1.00
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1270	1031		3610	3610	1583
v/s Ratio Prot	0.05			c0.49	0.38	
v/s Ratio Perm		c0.34				0.52
v/c Ratio	0.13	0.93		0.88	0.67	0.52
Uniform Delay, d1	25.0	36.3		22.6	18.4	0.0
Progression Factor	0.55	0.82		0.54	1.24	1.00
Incremental Delay, d2	0.0	9.9		0.8	0.8	1.0
Delay (s)	13.8	39.6		13.1	23.5	1.0
Level of Service	B	D		B	C	A
Approach Delay (s)	35.9			13.1	17.8	
Approach LOS	D			B	B	

Intersection Summary

HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	*0.95	1.00	1.00	0.95	1.00	0.97	*0.70	1.00	*1.00	0.86	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5309	1583	1770	3539	1583	3433	3912	1583	3539	6408	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5309	1583	1770	3539	1583	3433	3912	1583	3539	6408	2787
Volume (vph)	350	710	290	200	580	270	550	2290	560	360	2340	680
Peak-hour factor, PHF	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. Flow (vph)	350	710	290	200	580	270	550	2290	560	360	2340	680
RTOR Reduction (vph)	0	0	249	0	0	138	0	0	170	0	0	282
Lane Group Flow (vph)	350	710	41	200	580	132	550	2290	390	360	2340	398
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.0	17.0	17.0	13.0	18.0	18.0	22.0	62.0	62.0	12.0	52.0	52.0
Effective Green, g (s)	12.0	17.0	17.0	13.0	18.0	18.0	22.0	62.0	62.0	12.0	52.0	52.0
Actuated g/C Ratio	0.10	0.14	0.14	0.11	0.15	0.15	0.18	0.52	0.52	0.10	0.43	0.43
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	343	752	224	192	531	237	629	2021	818	354	2777	1208
v/s Ratio Prot	0.10	c0.13		0.11	c0.16		0.16	c0.59		c0.10	0.37	
v/s Ratio Perm			0.03			0.08			0.25			0.14
v/c Ratio	1.02	0.94	0.18	1.04	1.09	0.56	0.87	1.13	0.48	1.02	0.84	0.33
Uniform Delay, d1	54.0	51.0	45.4	53.5	51.0	47.3	47.7	29.0	18.6	54.0	30.3	22.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.58	0.31	0.02	1.13	0.91	1.39
Incremental Delay, d2	53.9	20.3	0.4	76.3	66.6	2.8	9.9	65.1	1.5	42.9	2.2	0.5
Delay (s)	107.9	71.3	45.8	129.8	117.6	50.2	37.7	74.1	1.9	103.9	29.9	31.6
Level of Service	F	E	D	F	F	D	D	E	A	F	C	C
Approach Delay (s)		75.3			102.6			56.3			38.1	
Approach LOS		E			F			E			D	

Intersection Summary

HCM Average Control Delay	57.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.86		1.00	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	1863	1583	1770	6393		1770	6334	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	1863	1583	1770	6393		1770	6334	
Volume (vph)	170	300	170	50	230	110	190	2570	40	150	2530	210
Peak-hour factor, PHF	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. Flow (vph)	170	300	170	50	230	110	190	2570	40	150	2530	210
RTOR Reduction (vph)	0	0	134	0	0	94	0	2	0	0	10	0
Lane Group Flow (vph)	170	300	36	50	230	16	190	2608	0	150	2730	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	14.4	25.3	25.3	6.3	17.2	17.2	14.7	59.7		12.7	57.7	
Effective Green, g (s)	14.4	25.3	25.3	6.3	17.2	17.2	14.7	59.7		12.7	57.7	
Actuated g/C Ratio	0.12	0.21	0.21	0.05	0.14	0.14	0.12	0.50		0.11	0.48	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	212	746	334	93	267	227	217	3181		187	3046	
v/s Ratio Prot	c0.10	0.08		0.03	c0.12		c0.11	0.41		0.08	c0.43	
v/s Ratio Perm			0.02			0.01						
v/c Ratio	0.80	0.40	0.11	0.54	0.86	0.07	0.88	0.82		0.80	0.90	
Uniform Delay, d1	51.4	40.8	38.2	55.4	50.2	44.5	51.8	25.6		52.4	28.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.81	0.14		0.82	0.16	
Incremental Delay, d2	19.2	0.4	0.1	5.9	23.6	0.1	14.0	1.0		12.8	2.7	
Delay (s)	70.6	41.2	38.4	61.3	73.8	44.6	55.7	4.6		55.7	7.2	
Level of Service	E	D	D	E	E	D	E	A		E	A	
Approach Delay (s)		48.3			64.0			8.1			9.7	
Approach LOS		D			E			A			A	

Intersection Summary

HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86		0.97	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	6311		3433	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3433	6311		3433	6408	1583
Volume (vph)	430	1000	250	290	1100	200	350	2330	260	270	2050	470
Peak-hour factor, PHF	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. Flow (vph)	430	1000	250	290	1100	200	350	2330	260	270	2050	470
RTOR Reduction (vph)	0	0	180	0	0	119	0	16	0	0	0	204
Lane Group Flow (vph)	430	1000	70	290	1100	81	350	2574	0	270	2050	267
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	16.0	30.0	30.0	13.0	27.0	27.0	15.0	51.0		10.0	46.0	46.0
Effective Green, g (s)	16.0	30.0	30.0	13.0	27.0	27.0	15.0	51.0		10.0	46.0	46.0
Actuated g/C Ratio	0.13	0.25	0.25	0.11	0.22	0.22	0.12	0.42		0.08	0.38	0.38
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	458	1271	396	372	1144	356	429	2682		286	2456	607
v/s Ratio Prot	c0.13	0.20		0.08	c0.22		0.10	c0.41		0.08	c0.32	
v/s Ratio Perm			0.04			0.05						0.17
v/c Ratio	0.94	0.79	0.18	0.78	0.96	0.23	0.82	0.96		0.94	0.83	0.44
Uniform Delay, d1	51.5	42.0	35.3	52.1	46.0	38.0	51.2	33.5		54.7	33.6	27.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.63	0.43	0.14
Incremental Delay, d2	29.3	5.0	1.0	14.9	18.8	1.5	15.6	10.2		27.0	1.9	1.2
Delay (s)	80.8	47.0	36.3	67.0	64.8	39.5	66.8	43.7		61.6	16.3	4.9
Level of Service	F	D	D	E	E	D	E	D		E	B	A
Approach Delay (s)		54.0			62.0			46.5			18.8	
Approach LOS		D			E			D			B	

Intersection Summary

HCM Average Control Delay	42.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.86		0.97	0.86	
Frt	1.00	0.96		1.00	0.96		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3415		3433	3397		3433	6308		3433	6309	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3415		3433	3397		3433	6308		3433	6309	
Volume (vph)	360	460	140	390	490	180	270	2330	270	240	2090	240
Peak-hour factor, PHF	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. Flow (vph)	360	460	140	390	490	180	270	2330	270	240	2090	240
RTOR Reduction (vph)	0	24	0	0	31	0	0	17	0	0	17	0
Lane Group Flow (vph)	360	576	0	390	639	0	270	2583	0	240	2313	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.1	23.5		15.0	24.4		11.8	55.5		10.0	53.7	
Effective Green, g (s)	14.1	23.5		15.0	24.4		11.8	55.5		10.0	53.7	
Actuated g/C Ratio	0.12	0.20		0.12	0.20		0.10	0.46		0.08	0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	403	669		429	691		338	2917		286	2823	
v/s Ratio Prot	0.10	c0.17		0.11	c0.19		0.08	c0.41		0.07	c0.37	
v/s Ratio Perm												
v/c Ratio	0.89	0.86		0.91	0.92		0.80	0.89		0.84	0.82	
Uniform Delay, d1	52.2	46.7		51.8	46.9		52.9	29.4		54.2	28.9	
Progression Factor	1.00	1.00		1.00	1.00		0.94	0.60		0.61	0.28	
Incremental Delay, d2	21.3	11.0		22.7	18.2		7.9	2.8		11.6	1.6	
Delay (s)	73.5	57.7		74.5	65.1		57.6	20.3		44.5	9.6	
Level of Service	E	E		E	E		E	C		D	A	
Approach Delay (s)		63.6			68.5			23.8			12.8	
Approach LOS		E			E			C			B	

Intersection Summary

HCM Average Control Delay	31.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.86		0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	6393		3433	6339	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	6393		3433	6339	
Volume (vph)	200	570	361	150	600	250	230	2510	40	230	2210	170
Peak-hour factor, PHF	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. Flow (vph)	200	570	361	150	600	250	230	2510	40	230	2210	170
RTOR Reduction (vph)	0	0	146	0	0	148	0	2	0	0	9	0
Lane Group Flow (vph)	200	570	215	150	600	102	230	2548	0	230	2371	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	16.2	24.7	24.7	14.7	23.2	23.2	10.0	54.5		10.1	54.6	
Effective Green, g (s)	16.2	24.7	24.7	14.7	23.2	23.2	10.0	54.5		10.1	54.6	
Actuated g/C Ratio	0.13	0.21	0.21	0.12	0.19	0.19	0.08	0.45		0.08	0.46	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	239	728	326	217	684	306	286	2903		289	2884	
v/s Ratio Prot	c0.11	0.16		0.08	c0.17		0.07	c0.40		0.07	c0.37	
v/s Ratio Perm			0.14			0.06						
v/c Ratio	0.84	0.78	0.66	0.69	0.88	0.33	0.80	0.88		0.80	0.82	
Uniform Delay, d1	50.6	45.1	43.8	50.5	47.0	41.7	54.0	29.7		53.9	28.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.61	0.30		1.00	1.00	
Incremental Delay, d2	21.7	5.5	4.8	9.1	12.2	0.6	7.0	1.9		14.0	2.8	
Delay (s)	72.3	50.6	48.5	59.6	59.2	42.4	40.0	10.9		68.0	31.3	
Level of Service	E	D	D	E	E	D	D	B		E	C	
Approach Delay (s)		53.8			55.1			13.3			34.5	
Approach LOS		D			E			B			C	

Intersection Summary

HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.86		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	6384		1770	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	6384		1770	6408	1583
Volume (vph)	80	370	30	70	310	200	110	2810	70	130	2090	50
Peak-hour factor, PHF	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. Flow (vph)	80	370	30	70	310	200	110	2810	70	130	2090	50
RTOR Reduction (vph)	0	0	26	0	0	173	0	3	0	0	0	21
Lane Group Flow (vph)	80	370	4	70	310	27	110	2877	0	130	2090	29
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	7.4	15.9	15.9	6.8	15.3	15.3	10.1	64.6		12.1	66.6	66.6
Effective Green, g (s)	7.4	15.9	15.9	6.8	15.3	15.3	10.1	64.6		12.1	66.6	66.6
Actuated g/C Ratio	0.06	0.14	0.14	0.06	0.13	0.13	0.09	0.56		0.10	0.58	0.58
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	114	488	218	104	469	210	155	3574		186	3698	914
v/s Ratio Prot	c0.05	c0.10		0.04	0.09		0.06	c0.45		c0.07	0.33	
v/s Ratio Perm			0.00			0.02						0.02
v/c Ratio	0.70	0.76	0.02	0.67	0.66	0.13	0.71	0.81		0.70	0.57	0.03
Uniform Delay, d1	52.9	47.9	43.0	53.2	47.6	44.2	51.2	20.4		49.9	15.3	10.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.7	6.6	0.0	15.8	3.5	0.3	13.9	2.0		10.9	0.6	0.1
Delay (s)	70.6	54.5	43.0	69.0	51.1	44.4	65.1	22.4		60.8	15.9	10.6
Level of Service	E	D	D	E	D	D	E	C		E	B	B
Approach Delay (s)		56.5			50.9			24.0			18.4	
Approach LOS		E			D			C			B	

Intersection Summary

HCM Average Control Delay	26.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	115.4	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	85	148	351	380	840	177
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	85	148	351	380	840	177
RTOR Reduction (vph)	0	0	0	203	0	126
Lane Group Flow (vph)	85	148	351	177	840	51
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	17.6	77.5	55.9	55.9	34.5	34.5
Effective Green, g (s)	17.6	77.5	55.9	55.9	34.5	34.5
Actuated g/C Ratio	0.15	0.65	0.47	0.47	0.29	0.29
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	260	2286	1649	737	987	455
v/s Ratio Prot	c0.05	0.04	0.10		c0.24	
v/s Ratio Perm				c0.11		0.03
v/c Ratio	0.33	0.06	0.21	0.24	0.85	0.11
Uniform Delay, d1	45.9	7.9	19.0	19.3	40.3	31.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	0.3	0.7	7.2	0.1
Delay (s)	46.6	7.9	19.3	20.0	47.5	31.6
Level of Service	D	A	B	B	D	C
Approach Delay (s)		22.0	19.7		44.7	
Approach LOS		C	B		D	

Intersection Summary

HCM Average Control Delay	32.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.88		0.86	0.86	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3433	2787		6408	6408	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3433	2787		6408	6408	1583
Volume (vph)	123	885	0	2460	2708	671
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	123	885	0	2460	2708	671
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	123	884	0	2460	2708	671
Turn Type		Perm				Free
Protected Phases	4			2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	41.0	41.0		71.0	71.0	120.0
Effective Green, g (s)	41.0	41.0		71.0	71.0	120.0
Actuated g/C Ratio	0.34	0.34		0.59	0.59	1.00
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1173	952		3791	3791	1583
v/s Ratio Prot	0.04			0.38	c0.42	
v/s Ratio Perm		c0.32				0.42
v/c Ratio	0.10	0.93		0.65	0.71	0.42
Uniform Delay, d1	27.0	38.1		16.2	17.3	0.0
Progression Factor	0.17	0.28		1.00	1.00	1.00
Incremental Delay, d2	0.0	10.9		0.9	1.2	0.8
Delay (s)	4.5	21.4		17.1	18.5	0.8
Level of Service	A	C		B	B	A
Approach Delay (s)	19.4			17.1	15.0	
Approach LOS	B			B	B	

Intersection Summary

HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	*0.30	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	*1.00	0.86	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1676	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1676	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Volume (vph)	211	743	137	110	410	310	143	1800	390	550	2655	358
Peak-hour factor, PHF	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. Flow (vph)	211	743	137	110	410	310	143	1800	390	550	2655	358
RTOR Reduction (vph)	0	0	45	0	0	249	0	0	61	0	0	153
Lane Group Flow (vph)	211	743	92	110	410	61	143	1800	329	550	2655	205
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.8	32.0	32.0	4.0	19.2	19.2	9.0	49.0	49.0	19.0	59.0	59.0
Effective Green, g (s)	16.8	32.0	32.0	4.0	19.2	19.2	9.0	49.0	49.0	19.0	59.0	59.0
Actuated g/C Ratio	0.14	0.27	0.27	0.03	0.16	0.16	0.08	0.41	0.41	0.16	0.49	0.49
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	481	447	422	114	566	253	257	1826	646	560	3151	1370
v/s Ratio Prot	0.06	c0.44		c0.03	0.12		0.04	c0.40		c0.16	0.41	
v/s Ratio Perm			0.06			0.04			0.21			0.07
v/c Ratio	0.44	1.66	0.22	0.96	0.72	0.24	0.56	0.99	0.51	0.98	0.84	0.15
Uniform Delay, d1	47.3	44.0	34.3	57.9	47.9	44.0	53.6	35.2	26.5	50.3	26.5	16.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.60	0.38	0.19	1.00	1.00	1.00
Incremental Delay, d2	0.6	307.8	1.2	72.6	4.6	0.5	2.0	15.4	2.2	33.3	2.9	0.2
Delay (s)	47.9	351.8	35.5	130.5	52.5	44.5	34.2	28.9	7.3	83.6	29.4	17.0
Level of Service	D	F	D	F	D	D	C	C	A	F	C	B
Approach Delay (s)		253.3			59.8			25.6			36.5	
Approach LOS		F			E			C			D	

Intersection Summary

HCM Average Control Delay	66.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.86		1.00	0.86	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3421		1770	6399		1770	6329	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3421		1770	6399		1770	6329	
Volume (vph)	170	480	220	50	280	80	150	2200	20	73	2579	230
Peak-hour factor, PHF	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. Flow (vph)	170	480	220	50	280	80	150	2200	20	73	2579	230
RTOR Reduction (vph)	0	0	148	0	22	0	0	1	0	0	12	0
Lane Group Flow (vph)	170	480	72	50	338	0	150	2219	0	73	2797	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	15.0	22.9	22.9	7.2	15.1		13.3	65.9		8.0	60.6	
Effective Green, g (s)	15.0	22.9	22.9	7.2	15.1		13.3	65.9		8.0	60.6	
Actuated g/C Ratio	0.12	0.19	0.19	0.06	0.13		0.11	0.55		0.07	0.51	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	221	675	302	106	430		196	3514		118	3196	
v/s Ratio Prot	c0.10	c0.14		0.03	c0.10		c0.08	c0.35		0.04	c0.44	
v/s Ratio Perm			0.05									
v/c Ratio	0.77	0.71	0.24	0.47	0.79		0.77	0.63		0.62	0.88	
Uniform Delay, d1	50.8	45.5	41.2	54.6	50.9		51.8	18.7		54.5	26.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.84	0.31		0.77	0.13	
Incremental Delay, d2	14.8	3.5	0.4	3.3	9.2		14.5	0.8		5.2	2.1	
Delay (s)	65.6	49.0	41.6	57.9	60.1		58.2	6.6		47.2	5.6	
Level of Service	E	D	D	E	E		E	A		D	A	
Approach Delay (s)		50.4			59.8			9.9			6.6	
Approach LOS		D			E			A			A	

Intersection Summary

HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.86		0.97	0.86	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4993		3433	5026		3433	6320		3433	6408	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4993		3433	5026		3433	6320		3433	6408	1583
Volume (vph)	301	1160	160	300	720	61	170	1387	140	273	1844	270
Peak-hour factor, PHF	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. Flow (vph)	301	1160	160	300	720	61	170	1387	140	273	1844	270
RTOR Reduction (vph)	0	15	0	0	10	0	0	13	0	0	0	160
Lane Group Flow (vph)	301	1305	0	300	771	0	170	1514	0	273	1844	110
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	26.9	36.4		14.0	23.5		9.6	39.6		14.0	44.0	44.0
Effective Green, g (s)	26.9	36.4		14.0	23.5		9.6	39.6		14.0	44.0	44.0
Actuated g/C Ratio	0.22	0.30		0.12	0.20		0.08	0.33		0.12	0.37	0.37
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	770	1515		401	984		275	2086		401	2350	580
v/s Ratio Prot	0.09	c0.26		0.09	c0.15		0.05	c0.24		0.08	c0.29	
v/s Ratio Perm												0.07
v/c Ratio	0.39	0.86		0.75	0.78		0.62	0.73		0.68	0.78	0.19
Uniform Delay, d1	39.6	39.4		51.3	45.8		53.4	35.4		50.9	33.8	25.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.56	0.38	0.22
Incremental Delay, d2	0.3	5.3		7.5	4.1		4.1	2.2		2.6	1.5	0.4
Delay (s)	39.9	44.7		58.7	50.0		57.5	37.7		31.3	14.3	6.0
Level of Service	D	D		E	D		E	D		C	B	A
Approach Delay (s)		43.8			52.4			39.6			15.3	
Approach LOS		D			D			D			B	

Intersection Summary

HCM Average Control Delay	34.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.86		0.97	0.86	
Frt	1.00	0.96		1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3412		3433	3409		3433	6343		3433	6302	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3412		3433	3409		3433	6343		3433	6302	
Volume (vph)	273	413	130	384	521	170	190	2041	148	210	2516	312
Peak-hour factor, PHF	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. Flow (vph)	273	413	130	384	521	170	190	2041	148	210	2516	312
RTOR Reduction (vph)	0	25	0	0	27	0	0	9	0	0	18	0
Lane Group Flow (vph)	273	518	0	384	664	0	190	2180	0	210	2810	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.2	20.4		16.1	25.3		8.3	55.5		12.0	59.2	
Effective Green, g (s)	11.2	20.4		16.1	25.3		8.3	55.5		12.0	59.2	
Actuated g/C Ratio	0.09	0.17		0.13	0.21		0.07	0.46		0.10	0.49	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	320	580		461	719		237	2934		343	3109	
v/s Ratio Prot	0.08	0.15		c0.11	c0.19		0.06	c0.34		0.06	c0.45	
v/s Ratio Perm												
v/c Ratio	0.85	0.89		0.83	0.92		0.80	0.74		0.61	0.90	
Uniform Delay, d1	53.6	48.7		50.6	46.4		55.0	26.4		51.8	27.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.59	0.24	
Incremental Delay, d2	19.2	16.0		12.2	17.5		17.5	1.7		1.3	2.0	
Delay (s)	72.8	64.8		62.8	63.9		72.5	28.2		31.7	8.7	
Level of Service	E	E		E	E		E	C		C	A	
Approach Delay (s)		67.5			63.5			31.7			10.3	
Approach LOS		E			E			C			B	

Intersection Summary

HCM Average Control Delay	31.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.86		0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	6400		3433	6337	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	6400		3433	6337	
Volume (vph)	190	520	510	134	580	180	270	2071	17	150	2401	190
Peak-hour factor, PHF	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. Flow (vph)	190	520	510	134	580	180	270	2071	17	150	2401	190
RTOR Reduction (vph)	0	0	134	0	0	133	0	1	0	0	10	0
Lane Group Flow (vph)	190	520	377	134	580	47	270	2087	0	150	2581	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	15.3	30.0	30.0	10.0	24.7	24.7	10.0	55.3		8.7	54.0	
Effective Green, g (s)	15.3	30.0	30.0	10.0	24.7	24.7	10.0	55.3		8.7	54.0	
Actuated g/C Ratio	0.13	0.25	0.25	0.08	0.21	0.21	0.08	0.46		0.07	0.45	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	226	885	396	148	728	326	286	2949		249	2852	
v/s Ratio Prot	c0.11	0.15		0.08	0.16		c0.08	0.33		0.04	c0.41	
v/s Ratio Perm			c0.24			0.03						
v/c Ratio	0.84	0.59	0.95	0.91	0.80	0.14	0.94	0.71		0.60	0.91	
Uniform Delay, d1	51.2	39.6	44.3	54.5	45.3	39.0	54.7	25.9		54.0	30.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.68	0.32		1.00	1.00	
Incremental Delay, d2	23.5	1.0	32.6	46.7	6.1	0.2	28.0	0.9		4.1	5.3	
Delay (s)	74.7	40.6	76.9	101.2	51.3	39.2	65.3	9.2		58.0	36.0	
Level of Service	E	D	E	F	D	D	E	A		E	D	
Approach Delay (s)		61.1			56.4			15.7			37.2	
Approach LOS		E			E			B			D	

Intersection Summary

HCM Average Control Delay	36.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.86		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	6394		1770	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	6394		1770	6408	1583
Volume (vph)	50	280	110	82	350	170	100	2313	34	100	3057	80
Peak-hour factor, PHF	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. Flow (vph)	50	280	110	82	350	170	100	2313	34	100	3057	80
RTOR Reduction (vph)	0	0	97	0	0	147	0	1	0	0	0	27
Lane Group Flow (vph)	50	280	13	82	350	23	100	2346	0	100	3057	53
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	6.3	14.6	14.6	7.8	16.1	16.1	10.4	70.5		11.1	71.2	71.2
Effective Green, g (s)	6.3	14.6	14.6	7.8	16.1	16.1	10.4	70.5		11.1	71.2	71.2
Actuated g/C Ratio	0.05	0.12	0.12	0.06	0.13	0.13	0.09	0.59		0.09	0.59	0.59
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	93	431	193	115	475	212	153	3756		164	3802	939
v/s Ratio Prot	0.03	0.08		c0.05	c0.10		c0.06	0.37		0.06	c0.48	
v/s Ratio Perm			0.01			0.01						0.03
v/c Ratio	0.54	0.65	0.07	0.71	0.74	0.11	0.65	0.62		0.61	0.80	0.06
Uniform Delay, d1	55.4	50.3	46.7	55.0	49.9	45.6	53.1	16.1		52.4	19.0	10.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.9	3.4	0.2	18.8	5.9	0.2	9.6	0.8		6.3	1.9	0.1
Delay (s)	61.3	53.6	46.8	73.8	55.8	45.9	62.7	16.9		58.7	20.9	10.4
Level of Service	E	D	D	E	E	D	E	B		E	C	B
Approach Delay (s)		52.8			55.4			18.8			21.8	
Approach LOS		D			E			B			C	

Intersection Summary

HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	416	272	366	630	960	267
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	416	272	366	630	960	267
RTOR Reduction (vph)	0	0	0	450	0	183
Lane Group Flow (vph)	416	272	366	180	960	84
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	36.0	74.2	34.2	34.2	37.8	37.8
Effective Green, g (s)	36.0	74.2	34.2	34.2	37.8	37.8
Actuated g/C Ratio	0.30	0.62	0.29	0.29	0.31	0.31
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	531	2188	1009	451	1081	499
v/s Ratio Prot	c0.24	0.08	0.10		c0.28	
v/s Ratio Perm				c0.11		0.05
v/c Ratio	0.78	0.12	0.36	0.40	0.89	0.17
Uniform Delay, d1	38.4	9.5	34.2	34.6	39.1	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	0.1	0.8	2.1	9.0	0.2
Delay (s)	45.9	9.6	35.0	36.7	48.1	29.9
Level of Service	D	A	D	D	D	C
Approach Delay (s)		31.5	36.1		44.2	
Approach LOS		C	D		D	

Intersection Summary

HCM Average Control Delay	38.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.88		0.86	0.86	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3433	2787		6408	6408	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3433	2787		6408	6408	1583
Volume (vph)	216	996	0	2900	2240	966
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	216	996	0	2900	2240	966
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	216	993	0	2900	2240	966
Turn Type		Perm				Free
Protected Phases	4			2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	44.5	44.5		67.5	67.5	120.0
Effective Green, g (s)	44.5	44.5		67.5	67.5	120.0
Actuated g/C Ratio	0.37	0.37		0.56	0.56	1.00
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1273	1034		3605	3605	1583
v/s Ratio Prot	0.06			c0.45	0.35	
v/s Ratio Perm		c0.36				0.61
v/c Ratio	0.17	0.96		0.80	0.62	0.61
Uniform Delay, d1	25.3	36.9		21.0	17.7	0.0
Progression Factor	0.25	0.34		1.00	1.00	1.00
Incremental Delay, d2	0.0	14.7		2.0	0.8	1.8
Delay (s)	6.4	27.4		23.0	18.5	1.8
Level of Service	A	C		C	B	A
Approach Delay (s)	23.6			23.0	13.4	
Approach LOS	C			C	B	

Intersection Summary

HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	*1.00	0.86	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Volume (vph)	423	775	318	210	649	280	594	2400	580	391	2375	810
Peak-hour factor, PHF	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. Flow (vph)	423	775	318	210	649	280	594	2400	580	391	2375	810
RTOR Reduction (vph)	0	0	245	0	0	127	0	0	136	0	0	295
Lane Group Flow (vph)	423	775	73	210	649	153	594	2400	444	391	2375	515
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	13.0	25.0	25.0	10.0	22.0	22.0	21.0	58.0	58.0	11.0	48.0	48.0
Effective Green, g (s)	13.0	25.0	25.0	10.0	22.0	22.0	21.0	58.0	58.0	11.0	48.0	48.0
Actuated g/C Ratio	0.11	0.21	0.21	0.08	0.18	0.18	0.18	0.48	0.48	0.09	0.40	0.40
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	372	1059	330	286	649	290	601	2161	765	324	2563	1115
v/s Ratio Prot	c0.12	0.15		0.06	c0.18		0.17	c0.54		c0.11	0.37	
v/s Ratio Perm			0.05			0.10			0.28			0.18
v/c Ratio	1.14	0.73	0.22	0.73	1.00	0.53	0.99	1.11	0.58	1.21	0.93	0.46
Uniform Delay, d1	53.5	44.4	39.4	53.7	49.0	44.3	49.4	31.0	22.3	54.5	34.3	26.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.62	0.40	0.06	1.00	1.00	1.00
Incremental Delay, d2	89.4	4.5	1.5	9.4	35.3	1.7	27.1	54.9	2.2	118.5	7.3	1.4
Delay (s)	142.9	48.8	40.9	63.1	84.3	46.1	57.8	67.4	3.5	173.0	41.6	27.9
Level of Service	F	D	D	E	F	D	E	E	A	F	D	C
Approach Delay (s)		73.4			71.0			55.4			52.9	
Approach LOS		E			E			E			D	

Intersection Summary

HCM Average Control Delay	59.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.86		1.00	0.86	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3393		1770	6394		1770	6329	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3393		1770	6394		1770	6329	
Volume (vph)	210	350	180	50	290	110	200	2657	40	153	2580	230
Peak-hour factor, PHF	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. Flow (vph)	210	350	180	50	290	110	200	2657	40	153	2580	230
RTOR Reduction (vph)	0	0	148	0	33	0	0	2	0	0	12	0
Lane Group Flow (vph)	210	350	32	50	367	0	200	2695	0	153	2798	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	16.6	21.1	21.1	11.0	15.5		15.0	57.9		14.0	56.9	
Effective Green, g (s)	16.6	21.1	21.1	11.0	15.5		15.0	57.9		14.0	56.9	
Actuated g/C Ratio	0.14	0.18	0.18	0.09	0.13		0.12	0.48		0.12	0.47	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	245	622	278	162	438		221	3085		207	3001	
v/s Ratio Prot	c0.12	0.10		0.03	c0.11		c0.11	0.42		0.09	c0.44	
v/s Ratio Perm			0.02									
v/c Ratio	0.86	0.56	0.11	0.31	0.84		0.90	0.87		0.74	0.93	
Uniform Delay, d1	50.5	45.2	41.6	50.9	51.0		51.8	27.8		51.2	29.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.73	0.32		0.79	0.10	
Incremental Delay, d2	24.3	1.2	0.2	1.1	13.1		5.2	0.4		6.7	3.6	
Delay (s)	74.9	46.4	41.8	52.0	64.1		43.1	9.2		47.3	6.6	
Level of Service	E	D	D	D	E		D	A		D	A	
Approach Delay (s)		53.3			62.8			11.5			8.7	
Approach LOS		D			E			B			A	

Intersection Summary

HCM Average Control Delay	18.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.86		0.97	0.86	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4939		3433	4955		3433	6314		3433	6408	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4939		3433	4955		3433	6314		3433	6408	1583
Volume (vph)	434	1050	250	300	1130	233	360	2390	260	283	2085	490
Peak-hour factor, PHF	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. Flow (vph)	434	1050	250	300	1130	233	360	2390	260	283	2085	490
RTOR Reduction (vph)	0	33	0	0	26	0	0	15	0	0	0	188
Lane Group Flow (vph)	434	1267	0	300	1337	0	360	2635	0	283	2085	302
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	15.0	35.0		11.0	31.0		14.7	48.0		10.0	43.3	43.3
Effective Green, g (s)	15.0	35.0		11.0	31.0		14.7	48.0		10.0	43.3	43.3
Actuated g/C Ratio	0.12	0.29		0.09	0.26		0.12	0.40		0.08	0.36	0.36
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	429	1441		315	1280		421	2526		286	2312	571
v/s Ratio Prot	0.13	c0.26		0.09	c0.27		0.10	c0.42		0.08	c0.33	
v/s Ratio Perm												0.19
v/c Ratio	1.01	0.88		0.95	1.04		0.86	1.04		0.99	0.90	0.53
Uniform Delay, d1	52.5	40.5		54.2	44.5		51.6	36.0		54.9	36.3	30.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.54	0.32	0.13
Incremental Delay, d2	46.4	6.4		37.9	37.6		15.5	30.4		33.8	3.2	1.7
Delay (s)	98.9	46.9		92.2	82.1		67.1	66.4		63.5	14.8	5.5
Level of Service	F	D		F	F		E	E		E	B	A
Approach Delay (s)		59.9			83.9			66.5			18.0	
Approach LOS		E			F			E			B	

Intersection Summary

HCM Average Control Delay	53.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.86		0.97	0.86	
Frt	1.00	0.97		1.00	0.96		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3418		3433	3405		3433	6306		3433	6307	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3418		3433	3405		3433	6306		3433	6307	
Volume (vph)	373	473	140	431	534	180	270	2504	298	250	2264	264
Peak-hour factor, PHF	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. Flow (vph)	373	473	140	431	534	180	270	2504	298	250	2264	264
RTOR Reduction (vph)	0	23	0	0	28	0	0	17	0	0	17	0
Lane Group Flow (vph)	373	590	0	431	686	0	270	2785	0	250	2511	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.0	22.5		16.5	25.0		10.0	56.0		9.0	55.0	
Effective Green, g (s)	14.0	22.5		16.5	25.0		10.0	56.0		9.0	55.0	
Actuated g/C Ratio	0.12	0.19		0.14	0.21		0.08	0.47		0.08	0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	401	641		472	709		286	2943		257	2891	
v/s Ratio Prot	0.11	0.17		c0.13	c0.20		0.08	c0.44		0.07	c0.40	
v/s Ratio Perm												
v/c Ratio	0.93	0.92		0.91	0.97		0.94	0.95		0.97	0.87	
Uniform Delay, d1	52.5	47.9		51.0	47.1		54.7	30.6		55.4	29.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.59	0.24	
Incremental Delay, d2	28.1	18.7		22.0	25.8		38.2	8.1		30.2	1.8	
Delay (s)	80.6	66.6		73.0	72.9		92.9	38.6		63.2	8.8	
Level of Service	F	E		E	E		F	D		E	A	
Approach Delay (s)		71.9			72.9			43.4			13.7	
Approach LOS		E			E			D			B	

Intersection Summary

HCM Average Control Delay	40.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.86		0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	6391		3433	6336	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	6391		3433	6336	
Volume (vph)	260	600	390	170	680	250	250	2672	47	230	2360	190
Peak-hour factor, PHF	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. Flow (vph)	260	600	390	170	680	250	250	2672	47	230	2360	190
RTOR Reduction (vph)	0	0	136	0	0	126	0	2	0	0	11	0
Lane Group Flow (vph)	260	600	254	170	680	124	250	2717	0	230	2539	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	18.0	25.1	25.1	16.9	24.0	24.0	9.0	53.0		9.0	53.0	
Effective Green, g (s)	18.0	25.1	25.1	16.9	24.0	24.0	9.0	53.0		9.0	53.0	
Actuated g/C Ratio	0.15	0.21	0.21	0.14	0.20	0.20	0.08	0.44		0.08	0.44	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	266	740	331	249	708	317	257	2823		257	2798	
v/s Ratio Prot	c0.15	0.17		0.10	c0.19		0.07	c0.43		0.07	c0.40	
v/s Ratio Perm			0.16			0.08						
v/c Ratio	0.98	0.81	0.77	0.68	0.96	0.39	0.97	0.96		0.89	0.91	
Uniform Delay, d1	50.8	45.2	44.7	49.0	47.5	41.7	55.4	32.5		55.0	31.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.61	0.33		1.00	1.00	
Incremental Delay, d2	48.4	6.7	10.2	7.5	24.4	0.8	25.5	4.3		30.1	5.6	
Delay (s)	99.2	51.9	54.9	56.5	71.9	42.5	59.1	15.0		85.1	36.8	
Level of Service	F	D	D	E	E	D	E	B		F	D	
Approach Delay (s)		62.7			62.8			18.7			40.8	
Approach LOS		E			E			B			D	

Intersection Summary

HCM Average Control Delay	39.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.86		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	6385		1770	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	6385		1770	6408	1583
Volume (vph)	90	390	40	76	330	200	120	3024	74	130	2209	50
Peak-hour factor, PHF	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. Flow (vph)	90	390	40	76	330	200	120	3024	74	130	2209	50
RTOR Reduction (vph)	0	0	34	0	0	164	0	3	0	0	0	22
Lane Group Flow (vph)	90	390	6	76	330	36	120	3095	0	130	2209	28
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	8.6	18.1	18.1	6.3	15.8	15.8	12.4	66.0		11.9	65.5	65.5
Effective Green, g (s)	8.6	18.1	18.1	6.3	15.8	15.8	12.4	66.0		11.9	65.5	65.5
Actuated g/C Ratio	0.07	0.15	0.15	0.05	0.13	0.13	0.10	0.56		0.10	0.55	0.55
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	129	541	242	94	473	211	186	3562		178	3548	876
v/s Ratio Prot	c0.05	c0.11		0.04	0.09		0.07	c0.48		c0.07	0.34	
v/s Ratio Perm			0.00			0.02						0.02
v/c Ratio	0.70	0.72	0.03	0.81	0.70	0.17	0.65	0.87		0.73	0.62	0.03
Uniform Delay, d1	53.6	47.7	42.6	55.4	49.0	45.4	50.8	22.4		51.6	18.0	12.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.2	4.7	0.0	38.1	4.5	0.4	7.5	2.5		14.3	0.3	0.0
Delay (s)	68.8	52.4	42.6	93.5	53.4	45.8	58.3	24.9		65.9	18.3	12.0
Level of Service	E	D	D	F	D	D	E	C		E	B	B
Approach Delay (s)		54.5			55.9			26.2			20.8	
Approach LOS		D			E			C			C	

Intersection Summary

HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	118.3	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	83	139	340	380	840	169
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	139	340	380	840	169
RTOR Reduction (vph)	0	0	0	203	0	120
Lane Group Flow (vph)	83	139	340	177	840	49
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	17.6	77.5	55.9	55.9	34.5	34.5
Effective Green, g (s)	17.6	77.5	55.9	55.9	34.5	34.5
Actuated g/C Ratio	0.15	0.65	0.47	0.47	0.29	0.29
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	260	2286	1649	737	987	455
v/s Ratio Prot	c0.05	0.04	0.10		c0.24	
v/s Ratio Perm				c0.11		0.03
v/c Ratio	0.32	0.06	0.21	0.24	0.85	0.11
Uniform Delay, d1	45.8	7.8	18.9	19.3	40.3	31.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	0.3	0.7	7.2	0.1
Delay (s)	46.5	7.9	19.2	20.0	47.5	31.5
Level of Service	D	A	B	C	D	C
Approach Delay (s)		22.3	19.6		44.8	
Approach LOS		C	B		D	

Intersection Summary

HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.88		0.86	0.86	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3433	2787		6408	6408	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3433	2787		6408	6408	1583
Volume (vph)	116	883	0	2460	2699	660
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	116	883	0	2460	2699	660
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	116	882	0	2460	2699	660
Turn Type		Perm				Free
Protected Phases	4			2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	41.0	41.0		71.0	71.0	120.0
Effective Green, g (s)	41.0	41.0		71.0	71.0	120.0
Actuated g/C Ratio	0.34	0.34		0.59	0.59	1.00
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1173	952		3791	3791	1583
v/s Ratio Prot	0.03			0.38	c0.42	
v/s Ratio Perm		c0.32				0.42
v/c Ratio	0.10	0.93		0.65	0.71	0.42
Uniform Delay, d1	26.9	38.1		16.2	17.3	0.0
Progression Factor	0.16	0.27		1.00	1.00	1.00
Incremental Delay, d2	0.0	10.6		0.9	1.2	0.8
Delay (s)	4.3	20.9		17.1	18.4	0.8
Level of Service	A	C		B	B	A
Approach Delay (s)	19.0			17.1	15.0	
Approach LOS	B			B	B	

Intersection Summary

HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	*0.30	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	*1.00	0.86	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1676	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1676	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Volume (vph)	206	738	134	110	405	310	136	1800	390	549	2654	349
Peak-hour factor, PHF	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. Flow (vph)	206	738	134	110	405	310	136	1800	390	549	2654	349
RTOR Reduction (vph)	0	0	44	0	0	250	0	0	61	0	0	149
Lane Group Flow (vph)	206	738	90	110	405	60	136	1800	329	549	2654	200
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	17.0	32.0	32.0	4.0	19.0	19.0	9.0	49.0	49.0	19.0	59.0	59.0
Effective Green, g (s)	17.0	32.0	32.0	4.0	19.0	19.0	9.0	49.0	49.0	19.0	59.0	59.0
Actuated g/C Ratio	0.14	0.27	0.27	0.03	0.16	0.16	0.08	0.41	0.41	0.16	0.49	0.49
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	486	447	422	114	560	251	257	1826	646	560	3151	1370
v/s Ratio Prot	0.06	c0.44		c0.03	0.11		0.04	c0.40		c0.16	0.41	
v/s Ratio Perm			0.06			0.04			0.21			0.07
v/c Ratio	0.42	1.65	0.21	0.96	0.72	0.24	0.53	0.99	0.51	0.98	0.84	0.15
Uniform Delay, d1	47.0	44.0	34.2	57.9	48.0	44.2	53.5	35.2	26.5	50.3	26.5	16.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.60	0.38	0.19	1.00	1.00	1.00
Incremental Delay, d2	0.6	302.8	1.2	72.6	4.6	0.5	1.5	15.4	2.2	32.9	2.9	0.2
Delay (s)	47.6	346.8	35.4	130.5	52.6	44.7	33.5	28.9	7.2	83.2	29.4	16.9
Level of Service	D	F	D	F	D	D	C	C	A	F	C	B
Approach Delay (s)		250.9			60.0			25.5			36.5	
Approach LOS		F			E			C			D	

Intersection Summary

HCM Average Control Delay	65.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.86		1.00	0.86	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3421		1770	6399		1770	6329	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3421		1770	6399		1770	6329	
Volume (vph)	170	480	220	50	280	80	150	2195	20	72	2576	230
Peak-hour factor, PHF	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. Flow (vph)	170	480	220	50	280	80	150	2195	20	72	2576	230
RTOR Reduction (vph)	0	0	148	0	22	0	0	1	0	0	12	0
Lane Group Flow (vph)	170	480	72	50	338	0	150	2214	0	72	2794	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	15.0	22.9	22.9	7.2	15.1		13.3	65.9		8.0	60.6	
Effective Green, g (s)	15.0	22.9	22.9	7.2	15.1		13.3	65.9		8.0	60.6	
Actuated g/C Ratio	0.12	0.19	0.19	0.06	0.13		0.11	0.55		0.07	0.51	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	221	675	302	106	430		196	3514		118	3196	
v/s Ratio Prot	c0.10	c0.14		0.03	c0.10		c0.08	c0.35		0.04	c0.44	
v/s Ratio Perm			0.05									
v/c Ratio	0.77	0.71	0.24	0.47	0.79		0.77	0.63		0.61	0.87	
Uniform Delay, d1	50.8	45.5	41.2	54.6	50.9		51.8	18.6		54.5	26.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.92	0.36		0.70	0.14	
Incremental Delay, d2	14.8	3.5	0.4	3.3	9.2		14.5	0.8		2.9	1.2	
Delay (s)	65.6	49.0	41.6	57.9	60.1		62.4	7.5		41.1	4.8	
Level of Service	E	D	D	E	E		E	A		D	A	
Approach Delay (s)		50.4			59.8			11.0			5.7	
Approach LOS		D			E			B			A	

Intersection Summary

HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.86		0.97	0.86	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4993		3433	5026		3433	6320		3433	6408	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4993		3433	5026		3433	6320		3433	6408	1583
Volume (vph)	301	1160	160	300	720	61	170	1384	140	272	1842	270
Peak-hour factor, PHF	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. Flow (vph)	301	1160	160	300	720	61	170	1384	140	272	1842	270
RTOR Reduction (vph)	0	15	0	0	10	0	0	13	0	0	0	160
Lane Group Flow (vph)	301	1305	0	300	771	0	170	1511	0	272	1842	110
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	26.9	36.4		14.0	23.5		9.6	39.6		14.0	44.0	44.0
Effective Green, g (s)	26.9	36.4		14.0	23.5		9.6	39.6		14.0	44.0	44.0
Actuated g/C Ratio	0.22	0.30		0.12	0.20		0.08	0.33		0.12	0.37	0.37
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	770	1515		401	984		275	2086		401	2350	580
v/s Ratio Prot	0.09	c0.26		0.09	c0.15		0.05	c0.24		0.08	c0.29	
v/s Ratio Perm												0.07
v/c Ratio	0.39	0.86		0.75	0.78		0.62	0.72		0.68	0.78	0.19
Uniform Delay, d1	39.6	39.4		51.3	45.8		53.4	35.4		50.8	33.8	25.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.56	0.38	0.22
Incremental Delay, d2	0.3	5.3		7.5	4.1		4.1	2.2		2.5	1.5	0.4
Delay (s)	39.9	44.7		58.7	50.0		57.5	37.6		31.2	14.3	6.0
Level of Service	D	D		E	D		E	D		C	B	A
Approach Delay (s)		43.8			52.4			39.6			15.2	
Approach LOS		D			D			D			B	

Intersection Summary

HCM Average Control Delay	34.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.86		0.97	0.86	
Frt	1.00	0.96		1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3412		3433	3409		3433	6344		3433	6302	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3412		3433	3409		3433	6344		3433	6302	
Volume (vph)	272	412	130	382	521	170	190	2036	146	210	2508	311
Peak-hour factor, PHF	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. Flow (vph)	272	412	130	382	521	170	190	2036	146	210	2508	311
RTOR Reduction (vph)	0	25	0	0	27	0	0	9	0	0	18	0
Lane Group Flow (vph)	272	517	0	382	664	0	190	2173	0	210	2801	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.2	20.4		16.1	25.3		8.3	55.4		12.1	59.2	
Effective Green, g (s)	11.2	20.4		16.1	25.3		8.3	55.4		12.1	59.2	
Actuated g/C Ratio	0.09	0.17		0.13	0.21		0.07	0.46		0.10	0.49	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	320	580		461	719		237	2929		346	3109	
v/s Ratio Prot	0.08	0.15		c0.11	c0.19		0.06	c0.34		0.06	c0.44	
v/s Ratio Perm												
v/c Ratio	0.85	0.89		0.83	0.92		0.80	0.74		0.61	0.90	
Uniform Delay, d1	53.6	48.7		50.6	46.4		55.0	26.4		51.7	27.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.58	0.23	
Incremental Delay, d2	18.6	15.9		11.7	17.5		17.5	1.7		1.2	1.9	
Delay (s)	72.2	64.6		62.3	63.9		72.5	28.2		30.9	8.2	
Level of Service	E	E		E	E		E	C		C	A	
Approach Delay (s)		67.1			63.3			31.7			9.8	
Approach LOS		E			E			C			A	

Intersection Summary

HCM Average Control Delay	31.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.86		0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	6400		3433	6337	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	6400		3433	6337	
Volume (vph)	190	520	510	132	580	180	270	2068	16	150	2395	190
Peak-hour factor, PHF	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. Flow (vph)	190	520	510	132	580	180	270	2068	16	150	2395	190
RTOR Reduction (vph)	0	0	146	0	0	134	0	1	0	0	10	0
Lane Group Flow (vph)	190	520	364	132	580	46	270	2083	0	150	2575	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	15.3	29.5	29.5	10.0	24.2	24.2	11.0	55.8		8.7	53.5	
Effective Green, g (s)	15.3	29.5	29.5	10.0	24.2	24.2	11.0	55.8		8.7	53.5	
Actuated g/C Ratio	0.13	0.25	0.25	0.08	0.20	0.20	0.09	0.46		0.07	0.45	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	226	870	389	148	714	319	315	2976		249	2825	
v/s Ratio Prot	c0.11	0.15		0.07	0.16		0.08	c0.33		0.04	c0.41	
v/s Ratio Perm			c0.23			0.03						
v/c Ratio	0.84	0.60	0.93	0.89	0.81	0.14	0.86	0.70		0.60	0.91	
Uniform Delay, d1	51.2	40.0	44.3	54.5	45.7	39.4	53.7	25.5		54.0	31.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.69	0.35		1.00	1.00	
Incremental Delay, d2	23.5	1.1	29.4	43.6	7.0	0.2	13.4	0.9		4.1	5.7	
Delay (s)	74.7	41.1	73.8	98.1	52.7	39.6	50.6	9.7		58.0	36.8	
Level of Service	E	D	E	F	D	D	D	A		E	D	
Approach Delay (s)		60.0			56.8			14.4			37.9	
Approach LOS		E			E			B			D	

Intersection Summary

HCM Average Control Delay	36.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.86		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	6394		1770	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	6394		1770	6408	1583
Volume (vph)	50	280	110	81	350	170	100	2311	33	100	3053	80
Peak-hour factor, PHF	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. Flow (vph)	50	280	110	81	350	170	100	2311	33	100	3053	80
RTOR Reduction (vph)	0	0	96	0	0	146	0	1	0	0	0	28
Lane Group Flow (vph)	50	280	14	81	350	24	100	2343	0	100	3053	52
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	5.6	13.8	13.8	6.9	15.1	15.1	7.7	61.9		8.5	62.7	62.7
Effective Green, g (s)	5.6	13.8	13.8	6.9	15.1	15.1	7.7	61.9		8.5	62.7	62.7
Actuated g/C Ratio	0.05	0.13	0.13	0.06	0.14	0.14	0.07	0.58		0.08	0.59	0.59
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	93	456	204	114	499	223	127	3696		140	3751	927
v/s Ratio Prot	0.03	0.08		c0.05	c0.10		c0.06	0.37		0.06	c0.48	
v/s Ratio Perm			0.01			0.02						0.03
v/c Ratio	0.54	0.61	0.07	0.71	0.70	0.11	0.79	0.63		0.71	0.81	0.06
Uniform Delay, d1	49.5	44.1	41.0	49.1	43.9	40.1	48.9	15.1		48.1	17.6	9.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.9	2.5	0.1	18.8	4.4	0.2	26.7	0.4		15.9	1.4	0.0
Delay (s)	55.4	46.6	41.2	67.9	48.3	40.3	75.6	15.4		64.0	19.0	9.5
Level of Service	E	D	D	E	D	D	E	B		E	B	A
Approach Delay (s)		46.2			48.7			17.9			20.2	
Approach LOS		D			D			B			C	

Intersection Summary

HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	107.1	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	411	253	353	630	960	256
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	411	253	353	630	960	256
RTOR Reduction (vph)	0	0	0	450	0	175
Lane Group Flow (vph)	411	253	353	180	960	81
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	36.0	74.2	34.2	34.2	37.8	37.8
Effective Green, g (s)	36.0	74.2	34.2	34.2	37.8	37.8
Actuated g/C Ratio	0.30	0.62	0.29	0.29	0.31	0.31
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	531	2188	1009	451	1081	499
v/s Ratio Prot	c0.23	0.07	0.10		c0.28	
v/s Ratio Perm				c0.11		0.05
v/c Ratio	0.77	0.12	0.35	0.40	0.89	0.16
Uniform Delay, d1	38.3	9.4	34.1	34.6	39.1	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.9	0.1	0.8	2.1	9.0	0.2
Delay (s)	45.2	9.5	34.9	36.7	48.1	29.8
Level of Service	D	A	C	D	D	C
Approach Delay (s)		31.6	36.1		44.3	
Approach LOS		C	D		D	

Intersection Summary

HCM Average Control Delay	38.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.88		0.86	0.86	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3433	2787		6408	6408	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3433	2787		6408	6408	1583
Volume (vph)	202	991	0	2900	2228	953
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	202	991	0	2900	2228	953
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	202	988	0	2900	2228	953
Turn Type		Perm				Free
Protected Phases	4			2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	44.5	44.5		67.5	67.5	120.0
Effective Green, g (s)	44.5	44.5		67.5	67.5	120.0
Actuated g/C Ratio	0.37	0.37		0.56	0.56	1.00
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1273	1034		3605	3605	1583
v/s Ratio Prot	0.06			c0.45	0.35	
v/s Ratio Perm		c0.35				0.60
v/c Ratio	0.16	0.96		0.80	0.62	0.60
Uniform Delay, d1	25.2	36.8		21.0	17.6	0.0
Progression Factor	0.23	0.33		1.00	1.00	1.00
Incremental Delay, d2	0.0	13.7		2.0	0.8	1.7
Delay (s)	5.9	25.8		23.0	18.4	1.7
Level of Service	A	C		C	B	A
Approach Delay (s)	22.4			23.0	13.4	
Approach LOS	C			C	B	

Intersection Summary

HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	*1.00	0.86	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Volume (vph)	413	765	312	210	642	280	586	2400	580	388	2374	798
Peak-hour factor, PHF	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. Flow (vph)	413	765	312	210	642	280	586	2400	580	388	2374	798
RTOR Reduction (vph)	0	0	245	0	0	127	0	0	136	0	0	296
Lane Group Flow (vph)	413	765	67	210	642	153	586	2400	444	388	2374	502
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	13.0	25.0	25.0	10.0	22.0	22.0	21.0	58.0	58.0	11.0	48.0	48.0
Effective Green, g (s)	13.0	25.0	25.0	10.0	22.0	22.0	21.0	58.0	58.0	11.0	48.0	48.0
Actuated g/C Ratio	0.11	0.21	0.21	0.08	0.18	0.18	0.18	0.48	0.48	0.09	0.40	0.40
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	372	1059	330	286	649	290	601	2161	765	324	2563	1115
v/s Ratio Prot	c0.12	0.15		0.06	c0.18		0.17	c0.54		c0.11	0.37	
v/s Ratio Perm			0.04			0.10			0.28			0.18
v/c Ratio	1.11	0.72	0.20	0.73	0.99	0.53	0.98	1.11	0.58	1.20	0.93	0.45
Uniform Delay, d1	53.5	44.3	39.3	53.7	48.9	44.3	49.2	31.0	22.3	54.5	34.3	26.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.62	0.40	0.06	1.00	1.00	1.00
Incremental Delay, d2	79.9	4.3	1.4	9.4	32.2	1.7	24.1	54.9	2.2	114.9	7.2	1.3
Delay (s)	133.4	48.5	40.6	63.1	81.1	46.1	54.7	67.4	3.6	169.4	41.6	27.7
Level of Service	F	D	D	E	F	D	D	E	A	F	D	C
Approach Delay (s)		70.4			69.1			54.9			52.4	
Approach LOS		E			E			D			D	

Intersection Summary

HCM Average Control Delay	58.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.86		1.00	0.86	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3393		1770	6394		1770	6329	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3393		1770	6394		1770	6329	
Volume (vph)	210	350	180	50	290	110	200	2650	40	152	2574	230
Peak-hour factor, PHF	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. Flow (vph)	210	350	180	50	290	110	200	2650	40	152	2574	230
RTOR Reduction (vph)	0	0	148	0	33	0	0	2	0	0	12	0
Lane Group Flow (vph)	210	350	32	50	367	0	200	2688	0	152	2792	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	16.6	21.1	21.1	11.0	15.5		15.0	57.9		14.0	56.9	
Effective Green, g (s)	16.6	21.1	21.1	11.0	15.5		15.0	57.9		14.0	56.9	
Actuated g/C Ratio	0.14	0.18	0.18	0.09	0.13		0.12	0.48		0.12	0.47	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	245	622	278	162	438		221	3085		207	3001	
v/s Ratio Prot	c0.12	0.10		0.03	c0.11		c0.11	0.42		0.09	c0.44	
v/s Ratio Perm			0.02									
v/c Ratio	0.86	0.56	0.11	0.31	0.84		0.90	0.87		0.73	0.93	
Uniform Delay, d1	50.5	45.2	41.6	50.9	51.0		51.8	27.7		51.2	29.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.73	0.32		0.79	0.10	
Incremental Delay, d2	24.3	1.2	0.2	1.1	13.1		5.2	0.4		6.5	3.6	
Delay (s)	74.9	46.4	41.8	52.0	64.1		43.2	9.1		47.0	6.5	
Level of Service	E	D	D	D	E		D	A		D	A	
Approach Delay (s)		53.3			62.8			11.5			8.6	
Approach LOS		D			E			B			A	

Intersection Summary

HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.86		0.97	0.86	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4939		3433	4955		3433	6313		3433	6408	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4939		3433	4955		3433	6313		3433	6408	1583
Volume (vph)	433	1050	250	300	1130	232	360	2386	260	282	2081	490
Peak-hour factor, PHF	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. Flow (vph)	433	1050	250	300	1130	232	360	2386	260	282	2081	490
RTOR Reduction (vph)	0	33	0	0	26	0	0	16	0	0	0	188
Lane Group Flow (vph)	433	1267	0	300	1336	0	360	2630	0	282	2081	302
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	15.0	35.0		11.0	31.0		14.7	48.0		10.0	43.3	43.3
Effective Green, g (s)	15.0	35.0		11.0	31.0		14.7	48.0		10.0	43.3	43.3
Actuated g/C Ratio	0.12	0.29		0.09	0.26		0.12	0.40		0.08	0.36	0.36
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	429	1441		315	1280		421	2525		286	2312	571
v/s Ratio Prot	0.13	c0.26		0.09	c0.27		0.10	c0.42		0.08	c0.32	
v/s Ratio Perm												0.19
v/c Ratio	1.01	0.88		0.95	1.04		0.86	1.04		0.99	0.90	0.53
Uniform Delay, d1	52.5	40.5		54.2	44.5		51.6	36.0		54.9	36.3	30.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.54	0.32	0.12
Incremental Delay, d2	45.8	6.4		37.9	37.4		15.5	29.9		33.2	3.2	1.7
Delay (s)	98.3	46.9		92.2	81.9		67.1	65.9		62.9	14.7	5.5
Level of Service	F	D		F	F		E	E		E	B	A
Approach Delay (s)		59.8			83.7			66.1			17.9	
Approach LOS		E			F			E			B	

Intersection Summary

HCM Average Control Delay	53.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.86		0.97	0.86	
Frt	1.00	0.97		1.00	0.96		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3418		3433	3405		3433	6306		3433	6307	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3418		3433	3405		3433	6306		3433	6307	
Volume (vph)	372	472	140	428	533	180	270	2493	296	250	2254	263
Peak-hour factor, PHF	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. Flow (vph)	372	472	140	428	533	180	270	2493	296	250	2254	263
RTOR Reduction (vph)	0	24	0	0	28	0	0	17	0	0	17	0
Lane Group Flow (vph)	372	588	0	428	685	0	270	2772	0	250	2500	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.0	22.5		16.5	25.0		11.8	56.0		9.0	53.2	
Effective Green, g (s)	14.0	22.5		16.5	25.0		11.8	56.0		9.0	53.2	
Actuated g/C Ratio	0.12	0.19		0.14	0.21		0.10	0.47		0.08	0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	401	641		472	709		338	2943		257	2796	
v/s Ratio Prot	0.11	0.17		c0.12	c0.20		0.08	c0.44		0.07	c0.40	
v/s Ratio Perm												
v/c Ratio	0.93	0.92		0.91	0.97		0.80	0.94		0.97	0.89	
Uniform Delay, d1	52.5	47.8		51.0	47.1		52.9	30.5		55.4	30.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.59	0.27	
Incremental Delay, d2	27.3	18.1		20.8	25.5		12.4	7.7		30.4	2.3	
Delay (s)	79.8	65.9		71.8	72.6		65.3	38.1		63.4	10.7	
Level of Service	E	E		E	E		E	D		E	B	
Approach Delay (s)		71.2			72.3			40.5			15.5	
Approach LOS		E			E			D			B	

Intersection Summary

HCM Average Control Delay	40.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.86		0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	6392		3433	6336	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	6392		3433	6336	
Volume (vph)	260	600	390	167	680	250	250	2666	45	230	2353	190
Peak-hour factor, PHF	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. Flow (vph)	260	600	390	167	680	250	250	2666	45	230	2353	190
RTOR Reduction (vph)	0	0	138	0	0	126	0	2	0	0	11	0
Lane Group Flow (vph)	260	600	252	167	680	124	250	2709	0	230	2532	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	18.0	25.1	25.1	16.9	24.0	24.0	9.0	53.0		9.0	53.0	
Effective Green, g (s)	18.0	25.1	25.1	16.9	24.0	24.0	9.0	53.0		9.0	53.0	
Actuated g/C Ratio	0.15	0.21	0.21	0.14	0.20	0.20	0.08	0.44		0.08	0.44	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	266	740	331	249	708	317	257	2823		257	2798	
v/s Ratio Prot	c0.15	0.17		0.09	c0.19		0.07	c0.42		0.07	c0.40	
v/s Ratio Perm			0.16			0.08						
v/c Ratio	0.98	0.81	0.76	0.67	0.96	0.39	0.97	0.96		0.89	0.91	
Uniform Delay, d1	50.8	45.2	44.6	48.9	47.5	41.7	55.4	32.5		55.0	31.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.61	0.33		1.00	1.00	
Incremental Delay, d2	48.4	6.7	10.0	6.9	24.4	0.8	25.9	4.2		30.1	5.4	
Delay (s)	99.2	51.9	54.6	55.8	71.9	42.5	59.4	14.8		85.1	36.6	
Level of Service	F	D	D	E	E	D	E	B		F	D	
Approach Delay (s)		62.6			62.8			18.6			40.6	
Approach LOS		E			E			B			D	

Intersection Summary

HCM Average Control Delay	39.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.86		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	6385		1770	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	6385		1770	6408	1583
Volume (vph)	90	390	40	74	330	200	120	3020	73	130	2204	50
Peak-hour factor, PHF	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. Flow (vph)	90	390	40	74	330	200	120	3020	73	130	2204	50
RTOR Reduction (vph)	0	0	34	0	0	169	0	3	0	0	0	22
Lane Group Flow (vph)	90	390	6	74	330	31	120	3090	0	130	2204	28
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	9.4	18.7	18.7	6.4	15.7	15.7	12.5	66.9		12.0	66.4	66.4
Effective Green, g (s)	9.4	18.7	18.7	6.4	15.7	15.7	12.5	66.9		12.0	66.4	66.4
Actuated g/C Ratio	0.08	0.16	0.16	0.05	0.13	0.13	0.10	0.56		0.10	0.55	0.55
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	139	551	247	94	463	207	184	3560		177	3546	876
v/s Ratio Prot	c0.05	c0.11		0.04	0.09		0.07	c0.48		c0.07	0.34	
v/s Ratio Perm			0.00			0.02						0.02
v/c Ratio	0.65	0.71	0.03	0.79	0.71	0.15	0.65	0.87		0.73	0.62	0.03
Uniform Delay, d1	53.7	48.1	42.9	56.1	50.0	46.2	51.7	22.8		52.5	18.2	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.9	4.1	0.0	34.1	5.1	0.3	8.0	3.2		14.6	0.8	0.1
Delay (s)	63.6	52.2	43.0	90.2	55.1	46.5	59.7	25.9		67.0	19.1	12.3
Level of Service	E	D	D	F	E	D	E	C		E	B	B
Approach Delay (s)		53.5			56.6			27.2			21.5	
Approach LOS		D			E			C			C	

Intersection Summary

HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	104	116	486	530	920	195
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	104	116	486	530	920	195
RTOR Reduction (vph)	0	0	0	275	0	133
Lane Group Flow (vph)	104	116	486	255	920	62
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	12.2	74.0	57.8	57.8	38.0	38.0
Effective Green, g (s)	12.2	74.0	57.8	57.8	38.0	38.0
Actuated g/C Ratio	0.10	0.62	0.48	0.48	0.32	0.32
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	180	2182	1705	762	1087	501
v/s Ratio Prot	c0.06	0.03	0.14		c0.27	
v/s Ratio Perm				c0.16		0.04
v/c Ratio	0.58	0.05	0.29	0.34	0.85	0.12
Uniform Delay, d1	51.4	9.1	18.7	19.2	38.3	29.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	0.0	0.3	1.0	6.2	0.1
Delay (s)	55.9	9.2	19.0	20.2	44.5	29.3
Level of Service	E	A	B	C	D	C
Approach Delay (s)		31.2	19.6		41.8	
Approach LOS		C	B		D	

Intersection Summary

HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.88		0.86	0.86	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3433	2787		6408	6408	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3433	2787		6408	6408	1583
Volume (vph)	102	974	0	2770	3025	966
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	102	974	0	2770	3025	966
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	102	974	0	2770	3025	966
Turn Type		Perm				Free
Protected Phases	4			2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	44.7	44.7		67.3	67.3	120.0
Effective Green, g (s)	44.7	44.7		67.3	67.3	120.0
Actuated g/C Ratio	0.37	0.37		0.56	0.56	1.00
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1279	1038		3594	3594	1583
v/s Ratio Prot	0.03			0.43	c0.47	
v/s Ratio Perm		c0.35				0.61
v/c Ratio	0.08	0.94		0.77	0.84	0.61
Uniform Delay, d1	24.3	36.3		20.4	21.9	0.0
Progression Factor	0.20	0.23		1.00	1.00	1.00
Incremental Delay, d2	0.0	11.1		1.7	2.6	1.8
Delay (s)	5.0	19.6		22.0	24.5	1.8
Level of Service	A	B		C	C	A
Approach Delay (s)	18.2			22.0	19.0	
Approach LOS	B			C	B	

Intersection Summary

HCM Average Control Delay	20.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	*0.50	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	*1.00	0.86	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	2794	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	2794	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Volume (vph)	208	819	124	120	463	320	143	2070	400	673	2821	445
Peak-hour factor, PHF	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. Flow (vph)	208	819	124	120	463	320	143	2070	400	673	2821	445
RTOR Reduction (vph)	0	0	62	0	0	257	0	0	56	0	0	179
Lane Group Flow (vph)	208	819	62	120	463	63	143	2070	344	673	2821	266
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.2	32.0	32.0	4.0	20.8	20.8	7.0	48.0	48.0	20.0	61.0	61.0
Effective Green, g (s)	15.2	32.0	32.0	4.0	20.8	20.8	7.0	48.0	48.0	20.0	61.0	61.0
Actuated g/C Ratio	0.13	0.27	0.27	0.03	0.17	0.17	0.06	0.40	0.40	0.17	0.51	0.51
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	435	745	422	114	613	274	200	1788	633	590	3257	1417
v/s Ratio Prot	0.06	c0.29		c0.03	0.13		0.04	c0.46		c0.19	0.44	
v/s Ratio Perm			0.04			0.04			0.22			0.10
v/c Ratio	0.48	1.10	0.15	1.05	0.76	0.23	0.71	1.16	0.54	1.14	0.87	0.19
Uniform Delay, d1	48.7	44.0	33.6	58.0	47.2	42.7	55.5	36.0	27.6	50.0	25.9	16.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.61	0.39	0.20	1.00	1.00	1.00
Incremental Delay, d2	0.8	63.5	0.7	99.1	5.3	0.4	7.7	75.5	2.2	82.3	3.4	0.3
Delay (s)	49.5	107.5	34.3	157.1	52.5	43.1	41.4	89.6	7.6	132.3	29.3	16.3
Level of Service	D	F	C	F	D	D	D	F	A	F	C	B
Approach Delay (s)		89.2			63.1			74.4			45.4	
Approach LOS		F			E			E			D	

Intersection Summary

HCM Average Control Delay	61.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.86		1.00	0.86	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3438		1770	6396		1770	6295	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3438		1770	6396		1770	6295	
Volume (vph)	180	620	240	60	380	90	160	2463	30	81	2625	350
Peak-hour factor, PHF	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. Flow (vph)	180	620	240	60	380	90	160	2463	30	81	2625	350
RTOR Reduction (vph)	0	0	143	0	17	0	0	1	0	0	21	0
Lane Group Flow (vph)	180	620	97	60	453	0	160	2492	0	81	2954	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.6	26.8	26.8	4.8	17.0		12.8	62.8		9.6	59.6	
Effective Green, g (s)	14.6	26.8	26.8	4.8	17.0		12.8	62.8		9.6	59.6	
Actuated g/C Ratio	0.12	0.22	0.22	0.04	0.14		0.11	0.52		0.08	0.50	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	790	354	71	487		189	3347		142	3127	
v/s Ratio Prot	c0.10	c0.18		0.03	c0.13		c0.09	0.39		0.05	c0.47	
v/s Ratio Perm			0.06									
v/c Ratio	0.84	0.78	0.27	0.85	0.93		0.85	0.74		0.57	0.94	
Uniform Delay, d1	51.5	43.9	38.6	57.2	50.9		52.6	22.3		53.2	28.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.86	0.32		0.72	0.16	
Incremental Delay, d2	23.7	5.1	0.4	56.7	24.2		24.4	1.3		2.8	4.2	
Delay (s)	75.2	49.0	39.0	114.0	75.1		69.6	8.5		41.0	8.7	
Level of Service	E	D	D	F	E		E	A		D	A	
Approach Delay (s)		51.2			79.5			12.2			9.6	
Approach LOS		D			E			B			A	

Intersection Summary

HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.86		0.97	0.86	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4988		3433	5020		3433	6286		3433	6408	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4988		3433	5020		3433	6286		3433	6408	1583
Volume (vph)	330	1160	170	410	750	70	220	1522	220	301	1844	340
Peak-hour factor, PHF	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. Flow (vph)	330	1160	170	410	750	70	220	1522	220	301	1844	340
RTOR Reduction (vph)	0	16	0	0	10	0	0	21	0	0	0	207
Lane Group Flow (vph)	330	1314	0	410	810	0	220	1721	0	301	1844	133
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	26.2	34.6		16.6	25.0		9.9	39.8		13.0	42.9	42.9
Effective Green, g (s)	26.2	34.6		16.6	25.0		9.9	39.8		13.0	42.9	42.9
Actuated g/C Ratio	0.22	0.29		0.14	0.21		0.08	0.33		0.11	0.36	0.36
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	750	1438		475	1046		283	2085		372	2291	566
v/s Ratio Prot	0.10	c0.26		c0.12	0.16		0.06	c0.27		0.09	c0.29	
v/s Ratio Perm												0.08
v/c Ratio	0.44	0.91		0.86	0.77		0.78	0.83		0.81	0.80	0.24
Uniform Delay, d1	40.6	41.3		50.6	44.8		54.0	36.9		52.3	34.8	27.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.62	0.45	0.27
Incremental Delay, d2	0.4	9.2		14.9	3.6		12.6	3.9		5.9	1.4	0.4
Delay (s)	41.0	50.4		65.5	48.5		66.6	40.8		38.5	17.2	7.7
Level of Service	D	D		E	D		E	D		D	B	A
Approach Delay (s)		48.5			54.2			43.7			18.5	
Approach LOS		D			D			D			B	

Intersection Summary

HCM Average Control Delay	38.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.86		0.97	0.86	
Frt	1.00	0.97		1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3423		3433	3405		3433	6329		3433	6289	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3423		3433	3405		3433	6329		3433	6289	
Volume (vph)	281	501	140	461	530	180	200	2248	202	240	2824	400
Peak-hour factor, PHF	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. Flow (vph)	281	501	140	461	530	180	200	2248	202	240	2824	400
RTOR Reduction (vph)	0	21	0	0	28	0	0	12	0	0	22	0
Lane Group Flow (vph)	281	620	0	461	682	0	200	2438	0	240	3203	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.7	21.0		16.0	26.3		7.0	56.0		11.0	60.0	
Effective Green, g (s)	10.7	21.0		16.0	26.3		7.0	56.0		11.0	60.0	
Actuated g/C Ratio	0.09	0.18		0.13	0.22		0.06	0.47		0.09	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	306	599		458	746		200	2954		315	3145	
v/s Ratio Prot	0.08	c0.18		c0.13	c0.20		0.06	c0.39		0.07	c0.51	
v/s Ratio Perm												
v/c Ratio	0.92	1.03		1.01	0.91		1.00	0.83		0.76	1.02	
Uniform Delay, d1	54.2	49.5		52.0	45.7		56.5	27.8		53.2	30.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.59	0.25	
Incremental Delay, d2	30.8	45.9		43.7	15.6		63.6	2.8		1.0	10.5	
Delay (s)	85.0	95.4		95.7	61.4		120.1	30.5		32.5	18.0	
Level of Service	F	F		F	E		F	C		C	B	
Approach Delay (s)		92.2			74.9			37.3			19.0	
Approach LOS		F			E			D			B	

Intersection Summary

HCM Average Control Delay	41.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.86		0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	6403		3433	6318	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	6403		3433	6318	
Volume (vph)	230	620	560	141	610	190	280	2266	12	160	2823	290
Peak-hour factor, PHF	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. Flow (vph)	230	620	560	141	610	190	280	2266	12	160	2823	290
RTOR Reduction (vph)	0	0	114	0	0	136	0	1	0	0	14	0
Lane Group Flow (vph)	230	620	446	141	610	54	280	2277	0	160	3099	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	16.0	30.0	30.0	9.0	23.0	23.0	9.0	55.5		9.5	56.0	
Effective Green, g (s)	16.0	30.0	30.0	9.0	23.0	23.0	9.0	55.5		9.5	56.0	
Actuated g/C Ratio	0.13	0.25	0.25	0.08	0.19	0.19	0.08	0.46		0.08	0.47	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	236	885	396	133	678	303	257	2961		272	2948	
v/s Ratio Prot	c0.13	0.18		0.08	0.17		c0.08	0.36		0.05	c0.49	
v/s Ratio Perm			c0.28			0.03						
v/c Ratio	0.97	0.70	1.13	1.06	0.90	0.18	1.09	0.77		0.59	1.05	
Uniform Delay, d1	51.8	40.9	45.0	55.5	47.4	40.6	55.5	26.9		53.4	32.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.63	0.24		1.00	1.00	
Incremental Delay, d2	51.0	2.5	84.2	95.0	14.8	0.3	66.6	1.0		3.2	32.0	
Delay (s)	102.8	43.4	129.2	150.5	62.2	40.9	101.5	7.5		56.6	64.0	
Level of Service	F	D	F	F	E	D	F	A		E	E	
Approach Delay (s)		87.2			71.1			17.8			63.6	
Approach LOS		F			E			B			E	

Intersection Summary

HCM Average Control Delay	54.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.86		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	6396		1770	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	6396		1770	6408	1583
Volume (vph)	50	290	130	81	370	180	130	2504	31	110	3612	80
Peak-hour factor, PHF	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. Flow (vph)	50	290	130	81	370	180	130	2504	31	110	3612	80
RTOR Reduction (vph)	0	0	113	0	0	143	0	1	0	0	0	25
Lane Group Flow (vph)	50	290	17	81	370	37	130	2534	0	110	3612	55
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	4.8	15.6	15.6	7.0	17.8	17.8	10.0	68.9		12.1	71.0	71.0
Effective Green, g (s)	4.8	15.6	15.6	7.0	17.8	17.8	10.0	68.9		12.1	71.0	71.0
Actuated g/C Ratio	0.04	0.13	0.13	0.06	0.15	0.15	0.08	0.58		0.10	0.59	0.59
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	71	462	206	104	527	236	148	3685		179	3804	940
v/s Ratio Prot	0.03	0.08		c0.05	c0.10		c0.07	0.40		0.06	c0.56	
v/s Ratio Perm			0.01			0.02						0.03
v/c Ratio	0.70	0.63	0.08	0.78	0.70	0.16	0.88	0.69		0.61	0.95	0.06
Uniform Delay, d1	56.7	49.2	45.7	55.5	48.4	44.4	54.2	17.8		51.5	22.6	10.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	27.1	2.7	0.2	29.9	4.2	0.3	40.1	0.5		6.1	6.3	0.0
Delay (s)	83.8	51.9	45.9	85.4	52.6	44.7	94.3	18.3		57.6	28.9	10.3
Level of Service	F	D	D	F	D	D	F	B		E	C	B
Approach Delay (s)		53.6			54.6			22.0			29.4	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	30.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	119.6	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	496	194	456	690	1030	267
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	496	194	456	690	1030	267
RTOR Reduction (vph)	0	0	0	445	0	168
Lane Group Flow (vph)	496	194	456	245	1030	99
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	35.7	73.8	34.1	34.1	38.2	38.2
Effective Green, g (s)	35.7	73.8	34.1	34.1	38.2	38.2
Actuated g/C Ratio	0.30	0.61	0.28	0.28	0.32	0.32
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	527	2176	1006	450	1093	504
v/s Ratio Prot	c0.28	0.05	0.13		c0.30	
v/s Ratio Perm				c0.16		0.06
v/c Ratio	0.94	0.09	0.45	0.55	0.94	0.20
Uniform Delay, d1	41.1	9.4	35.3	36.4	39.8	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.3	0.1	1.1	3.4	15.3	0.2
Delay (s)	66.4	9.5	36.4	39.8	55.1	29.9
Level of Service	E	A	D	D	E	C
Approach Delay (s)		50.4	38.5		49.9	
Approach LOS		D	D		D	

Intersection Summary

HCM Average Control Delay	45.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.88		0.86	0.86	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3433	2787		6408	6408	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3433	2787		6408	6408	1583
Volume (vph)	168	1026	0	3270	2416	1106
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	168	1026	0	3270	2416	1106
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	168	1024	0	3270	2416	1106
Turn Type		Perm				Free
Protected Phases	4			2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	45.8	45.8		66.2	66.2	120.0
Effective Green, g (s)	45.8	45.8		66.2	66.2	120.0
Actuated g/C Ratio	0.38	0.38		0.55	0.55	1.00
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1310	1064		3535	3535	1583
v/s Ratio Prot	0.05			c0.51	0.38	
v/s Ratio Perm		c0.37				0.70
v/c Ratio	0.13	0.96		0.93	0.68	0.70
Uniform Delay, d1	24.1	36.2		24.6	19.4	0.0
Progression Factor	0.18	0.22		1.00	1.00	1.00
Incremental Delay, d2	0.0	12.9		5.4	1.1	2.6
Delay (s)	4.4	20.9		30.0	20.5	2.6
Level of Service	A	C		C	C	A
Approach Delay (s)	18.6			30.0	14.8	
Approach LOS	B			C	B	

Intersection Summary

HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.91	1.00	*1.00	0.86	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	3539	1583	3433	5085	1583	3539	6408	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	3539	1583	3433	5085	1583	3539	6408	2787
Volume (vph)	482	801	306	220	708	300	568	2670	630	437	2449	936
Peak-hour factor, PHF	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. Flow (vph)	482	801	306	220	708	300	568	2670	630	437	2449	936
RTOR Reduction (vph)	0	0	235	0	0	149	0	0	133	0	0	336
Lane Group Flow (vph)	482	801	71	220	708	151	568	2670	497	437	2449	600
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.0	27.0	27.0	10.0	22.0	22.0	20.0	54.0	54.0	13.0	47.0	47.0
Effective Green, g (s)	15.0	27.0	27.0	10.0	22.0	22.0	20.0	54.0	54.0	13.0	47.0	47.0
Actuated g/C Ratio	0.12	0.22	0.22	0.08	0.18	0.18	0.17	0.45	0.45	0.11	0.39	0.39
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	429	1144	356	286	649	290	572	2288	712	383	2510	1092
v/s Ratio Prot	c0.14	0.16		0.06	c0.20		0.17	c0.53		c0.12	0.38	
v/s Ratio Perm			0.04			0.10			0.31			0.22
v/c Ratio	1.12	0.70	0.20	0.77	1.09	0.52	0.99	1.17	0.70	1.14	0.98	0.55
Uniform Delay, d1	52.5	42.8	37.7	53.9	49.0	44.2	49.9	33.0	26.5	53.5	35.9	28.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.61	0.42	0.09	1.00	1.00	1.00
Incremental Delay, d2	81.6	3.6	1.3	11.8	62.6	1.6	26.9	78.2	3.3	90.2	13.1	2.0
Delay (s)	134.1	46.4	39.0	65.6	111.6	45.8	57.6	92.2	5.8	143.7	49.0	30.3
Level of Service	F	D	D	E	F	D	E	F	A	F	D	C
Approach Delay (s)		71.6			87.3			73.0			55.3	
Approach LOS		E			F			E			E	

Intersection Summary

HCM Average Control Delay	68.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.86		1.00	0.86	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3423		1770	6394		1770	6315	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3423		1770	6394		1770	6315	
Volume (vph)	310	480	190	60	430	120	220	2768	40	159	2625	280
Peak-hour factor, PHF	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. Flow (vph)	310	480	190	60	430	120	220	2768	40	159	2625	280
RTOR Reduction (vph)	0	0	148	0	21	0	0	2	0	0	15	0
Lane Group Flow (vph)	310	480	42	60	529	0	220	2806	0	159	2890	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	20.8	26.7	26.7	11.1	17.0		14.0	55.2		11.0	52.2	
Effective Green, g (s)	20.8	26.7	26.7	11.1	17.0		14.0	55.2		11.0	52.2	
Actuated g/C Ratio	0.17	0.22	0.22	0.09	0.14		0.12	0.46		0.09	0.44	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	307	787	352	164	485		207	2941		162	2747	
v/s Ratio Prot	c0.18	0.14		0.03	c0.15		c0.12	0.44		0.09	c0.46	
v/s Ratio Perm			0.03									
v/c Ratio	1.01	0.61	0.12	0.37	1.09		1.06	0.95		0.98	1.05	
Uniform Delay, d1	49.6	42.0	37.3	51.1	51.5		53.0	31.2		54.4	33.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.77	0.24		0.77	0.14	
Incremental Delay, d2	53.9	1.3	0.2	1.4	67.4		38.1	1.1		41.6	28.2	
Delay (s)	103.5	43.3	37.4	52.5	118.9		78.6	8.7		83.4	32.8	
Level of Service	F	D	D	D	F		E	A		F	C	
Approach Delay (s)		61.2			112.4			13.8			35.5	
Approach LOS		E			F			B			D	

Intersection Summary

HCM Average Control Delay	36.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.86		0.97	0.86	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4945		3433	4936		3433	6312		3433	6408	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4945		3433	4936		3433	6312		3433	6408	1583
Volume (vph)	440	1150	260	320	1190	290	380	2449	270	289	2106	520
Peak-hour factor, PHF	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. Flow (vph)	440	1150	260	320	1190	290	380	2449	270	289	2106	520
RTOR Reduction (vph)	0	31	0	0	34	0	0	16	0	0	0	175
Lane Group Flow (vph)	440	1379	0	320	1446	0	380	2703	0	289	2106	345
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	14.0	34.0		12.0	32.0		14.0	48.0		10.0	44.0	44.0
Effective Green, g (s)	14.0	34.0		12.0	32.0		14.0	48.0		10.0	44.0	44.0
Actuated g/C Ratio	0.12	0.28		0.10	0.27		0.12	0.40		0.08	0.37	0.37
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	401	1401		343	1316		401	2525		286	2350	580
v/s Ratio Prot	0.13	c0.28		0.09	c0.29		0.11	c0.43		0.08	c0.33	
v/s Ratio Perm												0.22
v/c Ratio	1.10	0.98		0.93	1.10		0.95	1.07		1.01	0.90	0.59
Uniform Delay, d1	53.0	42.7		53.6	44.0		52.6	36.0		55.0	35.8	30.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.51	0.27	0.08
Incremental Delay, d2	73.8	20.2		31.6	56.3		31.5	40.3		31.6	1.9	1.3
Delay (s)	126.8	63.0		85.2	100.3		84.1	76.3		59.8	11.6	3.9
Level of Service	F	E		F	F		F	E		E	B	A
Approach Delay (s)		78.1			97.6			77.3			15.0	
Approach LOS		E			F			E			B	

Intersection Summary

HCM Average Control Delay	62.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.86		0.97	0.86	
Frt	1.00	0.97		1.00	0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3419		3433	3416		3433	6306		3433	6306	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3419		3433	3416		3433	6306		3433	6306	
Volume (vph)	399	479	140	479	630	190	280	2772	328	270	2527	300
Peak-hour factor, PHF	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. Flow (vph)	399	479	140	479	630	190	280	2772	328	270	2527	300
RTOR Reduction (vph)	0	23	0	0	24	0	0	17	0	0	17	0
Lane Group Flow (vph)	399	596	0	479	797	0	280	3083	0	270	2810	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	13.0	22.0		17.0	26.0		10.0	56.0		9.0	55.0	
Effective Green, g (s)	13.0	22.0		17.0	26.0		10.0	56.0		9.0	55.0	
Actuated g/C Ratio	0.11	0.18		0.14	0.22		0.08	0.47		0.08	0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	372	627		486	740		286	2943		257	2890	
v/s Ratio Prot	0.12	0.17		c0.14	c0.23		0.08	c0.49		0.08	c0.45	
v/s Ratio Perm												
v/c Ratio	1.07	0.95		0.99	1.08		0.98	1.05		1.05	0.97	
Uniform Delay, d1	53.5	48.5		51.4	47.0		54.9	32.0		55.5	31.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.56	0.22	
Incremental Delay, d2	67.3	24.3		36.8	55.6		46.9	30.8		32.1	1.7	
Delay (s)	120.8	72.8		88.1	102.6		101.8	62.8		63.0	8.8	
Level of Service	F	E		F	F		F	E		E	A	
Approach Delay (s)		91.6			97.2			66.0			13.5	
Approach LOS		F			F			E			B	

Intersection Summary

HCM Average Control Delay	55.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.86		0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	6396		3433	6323	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	6396		3433	6323	
Volume (vph)	410	680	460	179	860	260	310	2984	38	240	2598	250
Peak-hour factor, PHF	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. Flow (vph)	410	680	460	179	860	260	310	2984	38	240	2598	250
RTOR Reduction (vph)	0	0	143	0	0	98	0	1	0	0	13	0
Lane Group Flow (vph)	410	680	317	179	860	162	310	3021	0	240	2835	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	23.0	28.9	28.9	19.1	25.0	25.0	9.0	49.0		7.0	47.0	
Effective Green, g (s)	23.0	28.9	28.9	19.1	25.0	25.0	9.0	49.0		7.0	47.0	
Actuated g/C Ratio	0.19	0.24	0.24	0.16	0.21	0.21	0.08	0.41		0.06	0.39	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	339	852	381	282	737	330	257	2612		200	2477	
v/s Ratio Prot	c0.23	0.19		0.10	c0.24		0.09	c0.47		0.07	c0.45	
v/s Ratio Perm			0.20			0.10						
v/c Ratio	1.21	0.80	0.83	0.63	1.17	0.49	1.21	1.16		1.20	1.14	
Uniform Delay, d1	48.5	42.8	43.2	47.2	47.5	41.9	55.5	35.5		56.5	36.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.58	0.35		1.00	1.00	
Incremental Delay, d2	118.6	5.3	14.2	4.6	89.4	1.1	96.4	70.9		128.0	70.4	
Delay (s)	167.1	48.1	57.5	51.8	136.9	43.0	128.6	83.3		184.5	106.9	
Level of Service	F	D	E	D	F	D	F	F		F	F	
Approach Delay (s)		82.3			106.4			87.5			112.9	
Approach LOS		F			F			F			F	

Intersection Summary

HCM Average Control Delay	97.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

2030 with Project - Proposed GPA Option 2 - PM Peak Hour
252: Hazard & Beach

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.86		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	6386		1770	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	6386		1770	6408	1583
Volume (vph)	120	450	60	80	360	200	130	3476	79	140	2409	60
Peak-hour factor, PHF	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. Flow (vph)	120	450	60	80	360	200	130	3476	79	140	2409	60
RTOR Reduction (vph)	0	0	51	0	0	127	0	3	0	0	0	27
Lane Group Flow (vph)	120	450	9	80	360	73	130	3552	0	140	2409	33
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	9.0	18.3	18.3	6.0	15.3	15.3	13.3	69.1		10.6	66.4	66.4
Effective Green, g (s)	9.0	18.3	18.3	6.0	15.3	15.3	13.3	69.1		10.6	66.4	66.4
Actuated g/C Ratio	0.08	0.15	0.15	0.05	0.13	0.13	0.11	0.58		0.09	0.55	0.55
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	133	540	241	89	451	202	196	3677		156	3546	876
v/s Ratio Prot	c0.07	c0.13		0.05	0.10		0.07	c0.56		c0.08	0.38	
v/s Ratio Perm			0.01			0.05						0.02
v/c Ratio	0.90	0.83	0.04	0.90	0.80	0.36	0.66	0.97		0.90	0.68	0.04
Uniform Delay, d1	55.1	49.4	43.3	56.7	50.9	47.9	51.2	24.3		54.2	19.2	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	49.4	10.6	0.1	62.4	9.5	1.1	8.2	8.8		43.0	1.1	0.1
Delay (s)	104.5	60.0	43.4	119.1	60.4	49.0	59.4	33.2		97.2	20.2	12.3
Level of Service	F	E	D	F	E	D	E	C		F	C	B
Approach Delay (s)		66.9			64.2			34.1			24.2	
Approach LOS		E			E			C			C	

Intersection Summary

HCM Average Control Delay	36.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

2030 with Project - Alternative GPA - AM Peak Hour
18: Center & I-405 SB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	102	106	475	530	920	186
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	102	106	475	530	920	186
RTOR Reduction (vph)	0	0	0	274	0	127
Lane Group Flow (vph)	102	106	475	256	920	59
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	12.0	74.0	58.0	58.0	38.0	38.0
Effective Green, g (s)	12.0	74.0	58.0	58.0	38.0	38.0
Actuated g/C Ratio	0.10	0.62	0.48	0.48	0.32	0.32
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	2182	1711	765	1087	501
v/s Ratio Prot	c0.06	0.03	0.13		c0.27	
v/s Ratio Perm				c0.16		0.04
v/c Ratio	0.58	0.05	0.28	0.33	0.85	0.12
Uniform Delay, d1	51.6	9.1	18.5	19.1	38.3	29.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.5	0.0	0.3	1.0	6.2	0.1
Delay (s)	56.1	9.1	18.8	20.1	44.5	29.2
Level of Service	E	A	B	C	D	C
Approach Delay (s)		32.1	19.5		41.9	
Approach LOS		C	B		D	

Intersection Summary

HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.88		0.86	0.86	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3433	2787		6408	6408	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3433	2787		6408	6408	1583
Volume (vph)	95	972	0	2770	3016	955
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	972	0	2770	3016	955
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	95	971	0	2770	3016	955
Turn Type		Perm				Free
Protected Phases	4			2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	44.7	44.7		67.3	67.3	120.0
Effective Green, g (s)	44.7	44.7		67.3	67.3	120.0
Actuated g/C Ratio	0.37	0.37		0.56	0.56	1.00
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1279	1038		3594	3594	1583
v/s Ratio Prot	0.03			0.43	c0.47	
v/s Ratio Perm		c0.35				0.60
v/c Ratio	0.07	0.94		0.77	0.84	0.60
Uniform Delay, d1	24.3	36.3		20.4	21.9	0.0
Progression Factor	0.18	0.23		1.00	1.00	1.00
Incremental Delay, d2	0.0	10.8		1.7	2.5	1.7
Delay (s)	4.4	19.2		22.0	24.4	1.7
Level of Service	A	B		C	C	A
Approach Delay (s)	17.9			22.0	18.9	
Approach LOS	B			C	B	

Intersection Summary

HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	*0.50	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	*1.00	0.86	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	2794	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	2794	1583	3433	3539	1583	3433	4471	1583	3539	6408	2787
Volume (vph)	203	814	122	120	458	320	137	2070	400	671	2821	436
Peak-hour factor, PHF	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. Flow (vph)	203	814	122	120	458	320	137	2070	400	671	2821	436
RTOR Reduction (vph)	0	0	61	0	0	258	0	0	57	0	0	176
Lane Group Flow (vph)	203	814	61	120	458	62	137	2070	343	671	2821	260
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.3	32.0	32.0	4.0	20.7	20.7	7.0	48.0	48.0	20.0	61.0	61.0
Effective Green, g (s)	15.3	32.0	32.0	4.0	20.7	20.7	7.0	48.0	48.0	20.0	61.0	61.0
Actuated g/C Ratio	0.13	0.27	0.27	0.03	0.17	0.17	0.06	0.40	0.40	0.17	0.51	0.51
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	438	745	422	114	610	273	200	1788	633	590	3257	1417
v/s Ratio Prot	0.06	c0.29		c0.03	0.13		0.04	c0.46		c0.19	0.44	
v/s Ratio Perm			0.04			0.04			0.22			0.09
v/c Ratio	0.46	1.09	0.14	1.05	0.75	0.23	0.69	1.16	0.54	1.14	0.87	0.18
Uniform Delay, d1	48.5	44.0	33.6	58.0	47.2	42.8	55.4	36.0	27.6	50.0	25.9	16.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.61	0.39	0.19	1.00	1.00	1.00
Incremental Delay, d2	0.8	61.1	0.7	99.1	5.2	0.4	6.2	75.5	2.2	81.0	3.4	0.3
Delay (s)	49.3	105.1	34.3	157.1	52.4	43.2	39.9	89.5	7.5	131.0	29.3	16.3
Level of Service	D	F	C	F	D	D	D	F	A	F	C	B
Approach Delay (s)		87.6			63.1			74.3			45.2	
Approach LOS		F			E			E			D	

Intersection Summary

HCM Average Control Delay	61.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.86		1.00	0.86	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3438		1770	6396		1770	6295	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3438		1770	6396		1770	6295	
Volume (vph)	180	620	240	60	380	90	160	2458	30	80	2622	350
Peak-hour factor, PHF	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. Flow (vph)	180	620	240	60	380	90	160	2458	30	80	2622	350
RTOR Reduction (vph)	0	0	143	0	17	0	0	1	0	0	21	0
Lane Group Flow (vph)	180	620	97	60	453	0	160	2487	0	80	2951	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.6	26.8	26.8	4.8	17.0		12.8	62.8		9.6	59.6	
Effective Green, g (s)	14.6	26.8	26.8	4.8	17.0		12.8	62.8		9.6	59.6	
Actuated g/C Ratio	0.12	0.22	0.22	0.04	0.14		0.11	0.52		0.08	0.50	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	790	354	71	487		189	3347		142	3127	
v/s Ratio Prot	c0.10	c0.18		0.03	c0.13		c0.09	0.39		0.05	c0.47	
v/s Ratio Perm			0.06									
v/c Ratio	0.84	0.78	0.27	0.85	0.93		0.85	0.74		0.56	0.94	
Uniform Delay, d1	51.5	43.9	38.6	57.2	50.9		52.6	22.3		53.2	28.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.86	0.32		0.72	0.16	
Incremental Delay, d2	23.7	5.1	0.4	56.7	24.2		24.4	1.3		2.5	4.1	
Delay (s)	75.2	49.0	39.0	114.0	75.1		69.7	8.5		40.8	8.6	
Level of Service	E	D	D	F	E		E	A		D	A	
Approach Delay (s)		51.2			79.5			12.2			9.5	
Approach LOS		D			E			B			A	

Intersection Summary

HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.86		0.97	0.86	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4988		3433	5020		3433	6286		3433	6408	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4988		3433	5020		3433	6286		3433	6408	1583
Volume (vph)	330	1160	170	410	750	70	220	1518	220	300	1842	340
Peak-hour factor, PHF	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. Flow (vph)	330	1160	170	410	750	70	220	1518	220	300	1842	340
RTOR Reduction (vph)	0	16	0	0	10	0	0	21	0	0	0	208
Lane Group Flow (vph)	330	1314	0	410	810	0	220	1717	0	300	1842	132
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	26.2	34.6		16.6	25.0		9.9	39.8		13.0	42.9	42.9
Effective Green, g (s)	26.2	34.6		16.6	25.0		9.9	39.8		13.0	42.9	42.9
Actuated g/C Ratio	0.22	0.29		0.14	0.21		0.08	0.33		0.11	0.36	0.36
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	750	1438		475	1046		283	2085		372	2291	566
v/s Ratio Prot	0.10	c0.26		c0.12	0.16		0.06	c0.27		0.09	c0.29	
v/s Ratio Perm												0.08
v/c Ratio	0.44	0.91		0.86	0.77		0.78	0.82		0.81	0.80	0.23
Uniform Delay, d1	40.6	41.3		50.6	44.8		54.0	36.9		52.3	34.8	27.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.62	0.45	0.27
Incremental Delay, d2	0.4	9.2		14.9	3.6		12.6	3.8		5.8	1.4	0.4
Delay (s)	41.0	50.4		65.5	48.5		66.6	40.7		38.4	17.2	7.7
Level of Service	D	D		E	D		E	D		D	B	A
Approach Delay (s)		48.5			54.2			43.6			18.4	
Approach LOS		D			D			D			B	

Intersection Summary

HCM Average Control Delay	38.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.86		0.97	0.86	
Frt	1.00	0.97		1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3423		3433	3405		3433	6329		3433	6288	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3423		3433	3405		3433	6329		3433	6288	
Volume (vph)	280	500	140	459	530	180	200	2243	201	240	2816	400
Peak-hour factor, PHF	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. Flow (vph)	280	500	140	459	530	180	200	2243	201	240	2816	400
RTOR Reduction (vph)	0	21	0	0	28	0	0	12	0	0	22	0
Lane Group Flow (vph)	280	619	0	459	682	0	200	2432	0	240	3195	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.7	21.0		16.0	26.3		7.0	56.0		11.0	60.0	
Effective Green, g (s)	10.7	21.0		16.0	26.3		7.0	56.0		11.0	60.0	
Actuated g/C Ratio	0.09	0.18		0.13	0.22		0.06	0.47		0.09	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	306	599		458	746		200	2954		315	3144	
v/s Ratio Prot	0.08	c0.18		c0.13	c0.20		0.06	c0.38		0.07	c0.51	
v/s Ratio Perm												
v/c Ratio	0.92	1.03		1.00	0.91		1.00	0.82		0.76	1.02	
Uniform Delay, d1	54.2	49.5		52.0	45.7		56.5	27.7		53.2	30.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.59	0.25	
Incremental Delay, d2	30.3	45.4		42.6	15.6		63.6	2.7		1.0	9.7	
Delay (s)	84.5	94.9		94.6	61.4		120.1	30.5		32.5	17.1	
Level of Service	F	F		F	E		F	C		C	B	
Approach Delay (s)		91.7			74.4			37.2			18.2	
Approach LOS		F			E			D			B	

Intersection Summary

HCM Average Control Delay	40.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.86		0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	6403		3433	6318	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	6403		3433	6318	
Volume (vph)	230	620	560	139	610	190	280	2262	11	160	2818	290
Peak-hour factor, PHF	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. Flow (vph)	230	620	560	139	610	190	280	2262	11	160	2818	290
RTOR Reduction (vph)	0	0	114	0	0	136	0	1	0	0	14	0
Lane Group Flow (vph)	230	620	446	139	610	54	280	2272	0	160	3094	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	16.0	30.0	30.0	9.0	23.0	23.0	9.0	55.5		9.5	56.0	
Effective Green, g (s)	16.0	30.0	30.0	9.0	23.0	23.0	9.0	55.5		9.5	56.0	
Actuated g/C Ratio	0.13	0.25	0.25	0.08	0.19	0.19	0.08	0.46		0.08	0.47	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	236	885	396	133	678	303	257	2961		272	2948	
v/s Ratio Prot	c0.13	0.18		0.08	0.17		c0.08	0.35		0.05	c0.49	
v/s Ratio Perm			c0.28			0.03						
v/c Ratio	0.97	0.70	1.13	1.05	0.90	0.18	1.09	0.77		0.59	1.05	
Uniform Delay, d1	51.8	40.9	45.0	55.5	47.4	40.6	55.5	26.9		53.4	32.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.63	0.24		1.00	1.00	
Incremental Delay, d2	51.0	2.5	84.2	90.6	14.8	0.3	66.7	1.0		3.2	31.4	
Delay (s)	102.8	43.4	129.2	146.1	62.2	40.9	101.7	7.5		56.6	63.4	
Level of Service	F	D	F	F	E	D	F	A		E	E	
Approach Delay (s)		87.2			70.3			17.9			63.1	
Approach LOS		F			E			B			E	

Intersection Summary

HCM Average Control Delay	53.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

2030 with Project - Alternative GPA - AM Peak Hour
252: Hazard & Beach

Synchro 6 Report [B614]

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.86		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	6396		1770	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	6396		1770	6408	1583
Volume (vph)	50	290	130	80	370	180	130	2501	30	110	3608	80
Peak-hour factor, PHF	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. Flow (vph)	50	290	130	80	370	180	130	2501	30	110	3608	80
RTOR Reduction (vph)	0	0	113	0	0	143	0	1	0	0	0	25
Lane Group Flow (vph)	50	290	17	80	370	37	130	2530	0	110	3608	55
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	4.8	15.6	15.6	7.0	17.8	17.8	10.4	69.3		12.1	71.0	71.0
Effective Green, g (s)	4.8	15.6	15.6	7.0	17.8	17.8	10.4	69.3		12.1	71.0	71.0
Actuated g/C Ratio	0.04	0.13	0.13	0.06	0.15	0.15	0.09	0.58		0.10	0.59	0.59
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	71	460	206	103	525	235	153	3694		178	3791	937
v/s Ratio Prot	0.03	0.08		c0.05	c0.10		c0.07	0.40		0.06	c0.56	
v/s Ratio Perm			0.01			0.02						0.03
v/c Ratio	0.70	0.63	0.08	0.78	0.70	0.16	0.85	0.68		0.62	0.95	0.06
Uniform Delay, d1	56.9	49.5	45.9	55.7	48.6	44.6	54.0	17.7		51.7	22.9	10.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	27.1	2.8	0.2	29.9	4.3	0.3	33.2	1.1		6.3	7.1	0.1
Delay (s)	84.0	52.3	46.1	85.6	52.9	44.9	87.2	18.8		58.0	30.0	10.5
Level of Service	F	D	D	F	D	D	F	B		E	C	B
Approach Delay (s)		53.9			54.8			22.1			30.4	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	31.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

2030 with Project - Alternative GPA - PM Peak Hour
18: Center & I-405 SB Ramps

Synchro 6 Report [B614]

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	491	175	443	690	1030	255
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	491	175	443	690	1030	255
RTOR Reduction (vph)	0	0	0	445	0	160
Lane Group Flow (vph)	491	175	443	245	1030	95
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	35.5	73.8	34.3	34.3	38.2	38.2
Effective Green, g (s)	35.5	73.8	34.3	34.3	38.2	38.2
Actuated g/C Ratio	0.30	0.61	0.29	0.29	0.32	0.32
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	524	2176	1012	452	1093	504
v/s Ratio Prot	c0.28	0.05	0.13		c0.30	
v/s Ratio Perm				c0.15		0.06
v/c Ratio	0.94	0.08	0.44	0.54	0.94	0.19
Uniform Delay, d1	41.2	9.4	35.0	36.2	39.8	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.4	0.1	1.0	3.4	15.3	0.2
Delay (s)	65.6	9.4	36.0	39.6	55.1	29.8
Level of Service	E	A	D	D	E	C
Approach Delay (s)		50.8	38.2		50.1	
Approach LOS		D	D		D	

Intersection Summary

HCM Average Control Delay	45.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.88		0.86	0.86	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)	3433	2787		6408	6408	1583
Flt Permitted	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	3433	2787		6408	6408	1583
Volume (vph)	154	1021	0	3270	2404	1093
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	154	1021	0	3270	2404	1093
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	154	1019	0	3270	2404	1093
Turn Type		Perm				Free
Protected Phases	4			2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	45.7	45.7		66.3	66.3	120.0
Effective Green, g (s)	45.7	45.7		66.3	66.3	120.0
Actuated g/C Ratio	0.38	0.38		0.55	0.55	1.00
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1307	1061		3540	3540	1583
v/s Ratio Prot	0.04			c0.51	0.38	
v/s Ratio Perm		c0.37				0.69
v/c Ratio	0.12	0.96		0.92	0.68	0.69
Uniform Delay, d1	24.1	36.3		24.5	19.2	0.0
Progression Factor	0.16	0.20		1.00	1.00	1.00
Incremental Delay, d2	0.0	12.2		5.3	1.1	2.5
Delay (s)	3.9	19.5		29.9	20.3	2.5
Level of Service	A	B		C	C	A
Approach Delay (s)	17.5			29.9	14.7	
Approach LOS	B			C	B	

Intersection Summary

HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.91	1.00	*1.00	0.86	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	3539	1583	3433	5085	1583	3539	6408	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	3539	1583	3433	5085	1583	3539	6408	2787
Volume (vph)	472	790	300	220	701	300	559	2670	630	434	2447	924
Peak-hour factor, PHF	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. Flow (vph)	472	790	300	220	701	300	559	2670	630	434	2447	924
RTOR Reduction (vph)	0	0	233	0	0	150	0	0	134	0	0	316
Lane Group Flow (vph)	472	790	68	220	701	150	559	2670	496	434	2447	608
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.0	27.0	27.0	10.0	23.0	23.0	20.0	54.0	54.0	13.0	47.0	47.0
Effective Green, g (s)	14.0	27.0	27.0	10.0	23.0	23.0	20.0	54.0	54.0	13.0	47.0	47.0
Actuated g/C Ratio	0.12	0.22	0.22	0.08	0.19	0.19	0.17	0.45	0.45	0.11	0.39	0.39
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	401	1144	356	286	678	303	572	2288	712	383	2510	1092
v/s Ratio Prot	c0.14	0.16		0.06	c0.20		0.16	c0.53		c0.12	0.38	
v/s Ratio Perm			0.04			0.10			0.31			0.22
v/c Ratio	1.18	0.69	0.19	0.77	1.03	0.50	0.98	1.17	0.70	1.13	0.97	0.56
Uniform Delay, d1	53.0	42.7	37.6	53.9	48.5	43.3	49.8	33.0	26.4	53.5	35.9	28.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.61	0.42	0.09	1.00	1.00	1.00
Incremental Delay, d2	102.8	3.4	1.2	11.8	43.6	1.3	23.2	78.2	3.3	87.4	13.0	2.1
Delay (s)	155.8	46.1	38.8	65.6	92.1	44.6	53.7	92.2	5.8	140.9	48.9	30.5
Level of Service	F	D	D	E	F	D	D	F	A	F	D	C
Approach Delay (s)		77.8			75.7			72.5			54.9	
Approach LOS		E			E			E			D	

Intersection Summary

HCM Average Control Delay	67.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.86		1.00	0.86	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3423		1770	6394		1770	6315	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3423		1770	6394		1770	6315	
Volume (vph)	310	480	190	60	430	120	220	2762	40	158	2619	280
Peak-hour factor, PHF	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. Flow (vph)	310	480	190	60	430	120	220	2762	40	158	2619	280
RTOR Reduction (vph)	0	0	148	0	21	0	0	2	0	0	15	0
Lane Group Flow (vph)	310	480	42	60	529	0	220	2800	0	158	2884	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	20.8	26.7	26.7	11.1	17.0		14.0	55.2		11.0	52.2	
Effective Green, g (s)	20.8	26.7	26.7	11.1	17.0		14.0	55.2		11.0	52.2	
Actuated g/C Ratio	0.17	0.22	0.22	0.09	0.14		0.12	0.46		0.09	0.44	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	307	787	352	164	485		207	2941		162	2747	
v/s Ratio Prot	c0.18	0.14		0.03	c0.15		c0.12	0.44		0.09	c0.46	
v/s Ratio Perm			0.03									
v/c Ratio	1.01	0.61	0.12	0.37	1.09		1.06	0.95		0.98	1.05	
Uniform Delay, d1	49.6	42.0	37.3	51.1	51.5		53.0	31.1		54.4	33.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.77	0.24		0.77	0.13	
Incremental Delay, d2	53.9	1.3	0.2	1.4	67.4		38.1	1.0		39.9	27.4	
Delay (s)	103.5	43.3	37.4	52.5	118.9		78.7	8.6		81.6	31.9	
Level of Service	F	D	D	D	F		E	A		F	C	
Approach Delay (s)		61.2			112.4			13.7			34.5	
Approach LOS		E			F			B			C	

Intersection Summary

HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.86		0.97	0.86	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4945		3433	4936		3433	6312		3433	6408	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4945		3433	4936		3433	6312		3433	6408	1583
Volume (vph)	439	1150	260	320	1190	289	380	2444	270	288	2101	520
Peak-hour factor, PHF	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. Flow (vph)	439	1150	260	320	1190	289	380	2444	270	288	2101	520
RTOR Reduction (vph)	0	31	0	0	34	0	0	16	0	0	0	175
Lane Group Flow (vph)	439	1379	0	320	1445	0	380	2698	0	288	2101	345
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	14.0	34.0		12.0	32.0		14.0	48.0		10.0	44.0	44.0
Effective Green, g (s)	14.0	34.0		12.0	32.0		14.0	48.0		10.0	44.0	44.0
Actuated g/C Ratio	0.12	0.28		0.10	0.27		0.12	0.40		0.08	0.37	0.37
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	401	1401		343	1316		401	2525		286	2350	580
v/s Ratio Prot	0.13	c0.28		0.09	c0.29		0.11	c0.43		0.08	c0.33	
v/s Ratio Perm												0.22
v/c Ratio	1.09	0.98		0.93	1.10		0.95	1.07		1.01	0.89	0.59
Uniform Delay, d1	53.0	42.7		53.6	44.0		52.6	36.0		55.0	35.8	30.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.51	0.27	0.08
Incremental Delay, d2	73.0	20.2		31.6	56.0		31.5	39.6		30.9	1.9	1.4
Delay (s)	126.0	63.0		85.2	100.0		84.1	75.6		59.1	11.6	3.9
Level of Service	F	E		F	F		F	E		E	B	A
Approach Delay (s)		77.9			97.4			76.6			14.9	
Approach LOS		E			F			E			B	

Intersection Summary

HCM Average Control Delay	62.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.86		0.97	0.86	
Frt	1.00	0.97		1.00	0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3419		3433	3416		3433	6307		3433	6306	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3419		3433	3416		3433	6307		3433	6306	
Volume (vph)	398	478	140	477	629	190	280	2761	325	270	2516	299
Peak-hour factor, PHF	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. Flow (vph)	398	478	140	477	629	190	280	2761	325	270	2516	299
RTOR Reduction (vph)	0	23	0	0	24	0	0	17	0	0	17	0
Lane Group Flow (vph)	398	595	0	477	796	0	280	3069	0	270	2798	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	13.0	22.0		17.0	26.0		10.0	56.0		9.0	55.0	
Effective Green, g (s)	13.0	22.0		17.0	26.0		10.0	56.0		9.0	55.0	
Actuated g/C Ratio	0.11	0.18		0.14	0.22		0.08	0.47		0.08	0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	372	627		486	740		286	2943		257	2890	
v/s Ratio Prot	0.12	0.17		c0.14	c0.23		0.08	c0.49		0.08	c0.44	
v/s Ratio Perm												
v/c Ratio	1.07	0.95		0.98	1.07		0.98	1.04		1.05	0.97	
Uniform Delay, d1	53.5	48.4		51.3	47.0		54.9	32.0		55.5	31.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.56	0.22	
Incremental Delay, d2	66.5	23.8		35.8	55.1		46.9	29.1		32.1	1.5	
Delay (s)	120.0	72.2		87.2	102.1		101.8	61.1		63.1	8.6	
Level of Service	F	E		F	F		F	E		E	A	
Approach Delay (s)		90.9			96.6			64.5			13.3	
Approach LOS		F			F			E			B	

Intersection Summary

HCM Average Control Delay	54.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.86		0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	6396		3433	6323	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	6396		3433	6323	
Volume (vph)	410	680	460	177	860	260	310	2978	36	240	2591	250
Peak-hour factor, PHF	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. Flow (vph)	410	680	460	177	860	260	310	2978	36	240	2591	250
RTOR Reduction (vph)	0	0	140	0	0	98	0	1	0	0	13	0
Lane Group Flow (vph)	410	680	320	177	860	162	310	3013	0	240	2828	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	23.0	29.2	29.2	18.8	25.0	25.0	9.0	49.0		7.0	47.0	
Effective Green, g (s)	23.0	29.2	29.2	18.8	25.0	25.0	9.0	49.0		7.0	47.0	
Actuated g/C Ratio	0.19	0.24	0.24	0.16	0.21	0.21	0.08	0.41		0.06	0.39	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	339	861	385	277	737	330	257	2612		200	2477	
v/s Ratio Prot	c0.23	0.19		0.10	c0.24		0.09	c0.47		0.07	c0.45	
v/s Ratio Perm			c0.20			0.10						
v/c Ratio	1.21	0.79	0.83	0.64	1.17	0.49	1.21	1.15		1.20	1.14	
Uniform Delay, d1	48.5	42.5	43.1	47.4	47.5	41.9	55.5	35.5		56.5	36.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.58	0.35		1.00	1.00	
Incremental Delay, d2	118.6	4.9	14.1	4.8	89.4	1.1	96.4	69.5		128.0	69.2	
Delay (s)	167.1	47.4	57.2	52.2	136.9	43.0	128.7	82.0		184.5	105.7	
Level of Service	F	D	E	D	F	D	F	F		F	F	
Approach Delay (s)		82.0			106.6			86.3			111.8	
Approach LOS		F			F			F			F	

Intersection Summary

HCM Average Control Delay	96.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.86		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	6387		1770	6408	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	6387		1770	6408	1583
Volume (vph)	120	450	60	78	360	200	130	3472	78	140	2404	60
Peak-hour factor, PHF	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. Flow (vph)	120	450	60	78	360	200	130	3472	78	140	2404	60
RTOR Reduction (vph)	0	0	51	0	0	127	0	3	0	0	0	27
Lane Group Flow (vph)	120	450	9	78	360	73	130	3547	0	140	2404	33
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	9.0	18.3	18.3	6.0	15.3	15.3	13.3	69.1		10.6	66.4	66.4
Effective Green, g (s)	9.0	18.3	18.3	6.0	15.3	15.3	13.3	69.1		10.6	66.4	66.4
Actuated g/C Ratio	0.08	0.15	0.15	0.05	0.13	0.13	0.11	0.58		0.09	0.55	0.55
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	133	540	241	89	451	202	196	3678		156	3546	876
v/s Ratio Prot	c0.07	c0.13		0.04	0.10		0.07	c0.56		c0.08	0.38	
v/s Ratio Perm			0.01			0.05						0.02
v/c Ratio	0.90	0.83	0.04	0.88	0.80	0.36	0.66	0.96		0.90	0.68	0.04
Uniform Delay, d1	55.1	49.4	43.3	56.6	50.9	47.9	51.2	24.3		54.2	19.2	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	49.4	10.6	0.1	56.4	9.5	1.1	8.2	8.6		43.0	1.1	0.1
Delay (s)	104.5	60.0	43.4	113.0	60.4	49.0	59.4	32.9		97.2	20.2	12.3
Level of Service	F	E	D	F	E	D	E	C		F	C	B
Approach Delay (s)		66.9			63.2			33.8			24.2	
Approach LOS		E			E			C			C	

Intersection Summary

HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		

c Critical Lane Group

Appendix D

INTERSECTION VOLUME WORKSHEETS

Project Volume Worksheets

- GPA – AM/PM Peak Hour Inbound
- GPA – AM/PM Peak Hour Outbound
- Alternative GPA – AM/PM Peak Hour Inbound
- Alternative GPA – AM/PM Peak Hour Outbound

GP versus Project Volume Worksheets

- GPA – AM/PM Peak Hour Inbound
- GPA – AM/PM Peak Hour Outbound
- Alternative GPA – AM/PM Peak Hour Inbound
- Alternative GPA – AM/PM Peak Hour Outbound

Project ICU Worksheet

Table D-1: The Village at Bella Terra Trip Distribution - Proposed GPA Option 2

INBOUND		Southbound			Westbound			Northbound			Eastbound			
Intersection		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
8. Goldenwest St & Bolsa Ave	%		4.5%		1.0%								1.0%	6.5%
	AM		6		1								1	9
	PM		16		4								4	23
15. Goldenwest St & Mcfadden Ave	%	5.5%	1.0%									3.3%	1.0%	10.8%
	AM	7	1									4	1	14
	PM	20	4									12	4	39
16. Gothard St & McFadden Ave	%				2.2%								8.8%	11.0%
	AM				3								12	14
	PM				8								31	39
17. Gothard St & Center Ave	%	10.0%	1.0%							6.0%				17.0%
	AM	13	1							8				22
	PM	36	4							21				61
18. I-405 SB Ramps & Center Ave	%			13.2%		15.8%								29.0%
	AM			17		21								38
	PM			47		56								104
19. Beach Blvd & Center Ave.	%		14.1%	15.8%										29.9%
	AM		18	21										39
	PM		50	56										107
26. Goldenwest St. & Edinger Ave	%	2.0%								3.1%		7.1%		12.2%
	AM	3								4		9		16
	PM	7								11		25		44
27. Gothard St & Edinger Ave	%	1.0%							3.0%	8.1%	3.0%	9.2%		24.3%
	AM	1							4	11	4	12		32
	PM	4							11	29	11	33		87
28. Beach Blvd & Edinger Ave	%			14.1%		8.0%		9.6%						31.7%
	AM			18		10		13						42
	PM			50		29		34						113
29. Newland St & Edinger Ave	%			3.3%		4.5%		.						7.8%
	AM			4		6								10
	PM			12		16								28
36. Gothard St & Heil Ave	%								6.5%		3.5%			10.0%
	AM								9		5			13
	PM								23		12			36
37. Beach Blvd & Heil Ave	%					.			7.5%					7.5%
	AM								10					10
	PM								27					27
38. Newland St & Heil Ave	%					.		0.9%						0.9%
	AM							1						1
	PM							3						3
46. Gothard St & Warner Ave	%						1.0%		4.1%		.			5.1%
	AM						1		5					7
	PM						4		15					18
47. Beach Blvd & Warner Ave	%						0.8%		5.7%		1.0%			7.5%
	AM						1		7		1			10
	PM						3		20		4			27
48. Newland St & Warner Ave	%						.	0.6%						0.6%
	AM							1						1
	PM							2						2
250. Beach Blvd & McFadden Ave	%		12.4%	1.2%	3.0%	1.0%								17.6%
	AM		16	2	4	1								23
	PM		44	4	11	4								63
251. Beach Blvd & Bolsa Ave	%		8.3%		2.7%								.	11.0%
	AM		11		4									14
	PM		30		10									39
252. Beach Blvd & Hazard Ave	%		5.2%		1.6%								.	6.8%
	AM		7		2									9
	PM		19		6									24
253. Magnolia St & Edinger Ave	%					3.0%							.	3.0%
	AM					4								4
	PM					11								11
AM Out Volume													TOTAL	313
254													TOTAL	853
PM Out Volume														
271														
AM In Volume														
131														
PM In Volume														
357														

Table D-2: The Village at Bella Terra Trip Distribution - Proposed GPA Option 2

OUTBOUND		Southbound			Westbound			Northbound			Eastbound			
Intersection		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
8. Goldenwest St & Bolsa Ave	%							1.0%	4.5%	1.0%				6.5%
	AM							3	11	3				17
	PM							3	12	3				18
15. Goldenwest St & Mcfadden Ave	%					3.3%	5.5%	1.0%	1.0%					10.8%
	AM					8	14	3	3					27
	PM					9	15	3	3					29
16. Gothard St & McFadden Ave	%							8.8%		2.2%				11.0%
	AM							22		6				28
	PM							24		6				30
17. Gothard St & Center Ave	%				6.0%		10.0%		1.0%					17.0%
	AM				15		25		3					43
	PM				16		27		3					46
18. I-405 SB Ramps & Center Ave	%										6.0%	23.0%		29.0%
	AM										15	58		74
	PM										16	62		79
19. Beach Blvd & Center Ave.	%										17.0%		6.0%	23.0%
	AM										43		15	58
	PM										46		16	62
26. Goldenwest St. & Edinger Ave	%				3.1%	7.1%	2.0%							12.2%
	AM				8	18	5							31
	PM				8	19	5							33
27. Gothard St & Edinger Ave	%		3.0%	3.0%	8.1%	9.2%	1.0%							24.3%
	AM		8	8	21	23	3							62
	PM		8	8	22	25	3							66
28. Beach Blvd & Edinger Ave	%	4.0%	2.0%								12.1%	13.0%	6.6%	37.7%
	AM	10	5								31	33	17	96
	PM	11	5								33	35	18	102
29. Newland St & Edinger Ave	%										3.3%	4.5%		7.8%
	AM										8	11		20
	PM										9	12		21
36. Gothard St & Heil Ave	%		6.5%	3.5%										10.0%
	AM		17	9										25
	PM		18	9										27
37. Beach Blvd & Heil Ave	%	1.1%	7.5%											8.6%
	AM	3	19											22
	PM	3	20											23
38. Newland St & Heil Ave	%												0.9%	0.9%
	AM												2	2
	PM												2	2
46. Gothard St & Warner Ave	%		4.1%	1.0%										5.1%
	AM		10	3										13
	PM		11	3										14
47. Beach Blvd & Warner Ave	%	1.0%	5.7%											6.7%
	AM	3	14											17
	PM	3	15											18
48. Newland St & Warner Ave	%												0.6%	0.6%
	AM												2	2
	PM												2	2
250. Beach Blvd & McFadden Ave	%								12.4%	3.0%	1.2%	1.0%		17.6%
	AM								31	8	3	3		45
	PM								34	8	3	3		48
251. Beach Blvd & Bolsa Ave	%							.	8.3%	2.7%				11.0%
	AM								21	7				28
	PM								22	7				30
252. Beach Blvd & Hazard Ave	%							.	5.2%	1.6%				6.8%
	AM								13	4				17
	PM								14	4				18
253. Magnolia St & Edinger Ave	%							.				3.0%		3.0%
	AM											8		8
	PM											8		8
AM Out Volume														605
254														646
PM Out Volume														
271														
AM In Volume														
131														
PM In Volume														
357														

Table D-3: The Village at Bella Terra Trip Distribution - Alternative GPA

INBOUND		Southbound			Westbound			Northbound			Eastbound			
Intersection		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
8. Goldenwest St & Bolsa Ave	%		4.5%		1.0%								1.0%	6.5%
	AM		3		1								1	4
	PM		12		3								3	18
15. Goldenwest St & Mcfadden Ave	%	5.5%	1.0%									3.3%	1.0%	10.8%
	AM	4	1									2	1	7
	PM	15	3									9	3	29
16. Gothard St & McFadden Ave	%				2.2%								8.8%	11.0%
	AM				1								6	7
	PM				6								24	30
17. Gothard St & Center Ave	%	10.0%	1.0%							6.0%				17.0%
	AM	7	1							4				11
	PM	27	3							16				46
18. I-405 SB Ramps & Center Ave	%			13.2%		15.8%								29.0%
	AM			9		10								19
	PM			36		43								79
19. Beach Blvd & Center Ave.	%		14.1%	15.8%										29.9%
	AM		9	10										20
	PM		38	43										82
26. Goldenwest St. & Edinger Ave	%	2.0%								3.1%		7.1%		12.2%
	AM	1								2		5		8
	PM	5								8		19		33
27. Gothard St & Edinger Ave	%	1.0%							3.0%	8.1%	3.0%	9.2%		24.3%
	AM	1							2	5	2	6		16
	PM	3							8	22	8	25		66
28. Beach Blvd & Edinger Ave	%			14.1%		8.0%		9.6%						31.7%
	AM			9		5		6						21
	PM			38		22		26						87
29. Newland St & Edinger Ave	%			3.3%		4.5%		.						7.8%
	AM			2		3								5
	PM			9		12								21
36. Gothard St & Heil Ave	%								6.5%		3.5%			10.0%
	AM								4		2			7
	PM								18		10			27
37. Beach Blvd & Heil Ave	%					.			7.5%					7.5%
	AM								5					5
	PM								20					20
38. Newland St & Heil Ave	%					.		0.9%						0.9%
	AM							1						1
	PM							2						2
46. Gothard St & Warner Ave	%						1.0%		4.1%		.			5.1%
	AM						1		3					3
	PM						3		11					14
47. Beach Blvd & Warner Ave	%						0.8%		5.7%		1.0%			7.5%
	AM						1		4		1			5
	PM						2		16		3			20
48. Newland St & Warner Ave	%						.	0.6%						0.6%
	AM							0						0
	PM							2						2
250. Beach Blvd & McFadden Ave	%		12.4%	1.2%	3.0%	1.0%								17.6%
	AM		8	1	2	1								12
	PM		34	3	8	3								48
251. Beach Blvd & Bolsa Ave	%		8.3%		2.7%								.	11.0%
	AM		5		2									7
	PM		23		7									30
252. Beach Blvd & Hazard Ave	%		5.2%		1.6%								.	6.8%
	AM		3		1									4
	PM		14		4									19
253. Magnolia St & Edinger Ave	%					3.0%							.	3.0%
	AM					2								2
	PM					8								8
AM Out Volume													TOTAL	158
213													TOTAL	652
PM Out Volume														
189														
AM In Volume														
66														
PM In Volume														
273														

Table D-4: The Village at Bella Terra Trip Distribution - Alternative GPA

OUTBOUND		Southbound			Westbound			Northbound			Eastbound			
Intersection		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
8. Goldenwest St & Bolsa Ave	%							1.0%	4.5%	1.0%				6.5%
	AM							2	10	2				14
	PM							2	9	2				12
15. Goldenwest St & Mcfadden Ave	%					3.3%	5.5%	1.0%	1.0%					10.8%
	AM					7	12	2	2					23
	PM					6	10	2	2					20
16. Gothard St & McFadden Ave	%							8.8%		2.2%				11.0%
	AM							19		5				23
	PM							17		4				21
17. Gothard St & Center Ave	%				6.0%		10.0%		1.0%					17.0%
	AM				13		21		2					36
	PM				11		19		2					32
18. I-405 SB Ramps & Center Ave	%										6.0%	23.0%		29.0%
	AM										13	49		62
	PM										11	43		55
19. Beach Blvd & Center Ave.	%										17.0%		6.0%	23.0%
	AM										36		13	49
	PM										32		11	43
26. Goldenwest St. & Edinger Ave	%				3.1%	7.1%	2.0%							12.2%
	AM				7	15	4							26
	PM				6	13	4							23
27. Gothard St & Edinger Ave	%		3.0%	3.0%	8.1%	9.2%	1.0%							24.3%
	AM		6	6	17	20	2							52
	PM		6	6	15	17	2							46
28. Beach Blvd & Edinger Ave	%	4.0%	2.0%								12.1%	13.0%	6.6%	37.7%
	AM	9	4								26	28	14	80
	PM	8	4								23	25	12	71
29. Newland St & Edinger Ave	%										3.3%	4.5%		7.8%
	AM										7	10		17
	PM										6	9		15
36. Gothard St & Heil Ave	%		6.5%	3.5%										10.0%
	AM		14	7										21
	PM		12	7										19
37. Beach Blvd & Heil Ave	%	1.1%	7.5%											8.6%
	AM	2	16											18
	PM	2	14											16
38. Newland St & Heil Ave	%												0.9%	0.9%
	AM												2	2
	PM												2	2
46. Gothard St & Warner Ave	%		4.1%	1.0%										5.1%
	AM		9	2										11
	PM		8	2										10
47. Beach Blvd & Warner Ave	%	1.0%	5.7%											6.7%
	AM	2	12											14
	PM	2	11											13
48. Newland St & Warner Ave	%												0.6%	0.6%
	AM												1	1
	PM												1	1
250. Beach Blvd & McFadden Ave	%								12.4%	3.0%	1.2%	1.0%		17.6%
	AM								26	6	3	2		37
	PM								23	6	2	2		33
251. Beach Blvd & Bolsa Ave	%							.	8.3%	2.7%				11.0%
	AM								18	6				23
	PM								16	5				21
252. Beach Blvd & Hazard Ave	%							.	5.2%	1.6%				6.8%
	AM								11	3				14
	PM								10	3				13
253. Magnolia St & Edinger Ave	%							.				3.0%		3.0%
	AM											6		6
	PM											6		6
AM Out Volume														508
213														450
PM Out Volume														
189														
AM In Volume														
66														
PM In Volume														
273														

Table D-5: The Village at Bella Terra Trip Distribution - GP Versus Proposed GPA Option 2

INBOUND		Southbound			Westbound			Northbound			Eastbound			
Intersection		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
8. Goldenwest St & Bolsa Ave	%		4.5%		1.0%								1.0%	6.5%
	AM		2		0								0	2
	PM		-1		0								0	-2
15. Goldenwest St & Mcfadden Ave	%	5.5%	1.0%									3.3%	1.0%	10.8%
	AM	2	0									1	0	4
	PM	-1	0									-1	0	-3
16. Gothard St & McFadden Ave	%				2.2%								8.8%	11.0%
	AM				1								3	4
	PM				-1								-2	-3
17. Gothard St & Center Ave	%	10.0%	1.0%							6.0%				17.0%
	AM	4	0							2				6
	PM	-3	0							-2				-4
18. I-405 SB Ramps & Center Ave	%			13.2%		15.8%								29.0%
	AM			5		6								10
	PM			-3		-4								-8
19. Beach Blvd & Center Ave.	%		14.1%	15.8%										29.9%
	AM		5	6										10
	PM		-4	-4										-8
26. Goldenwest St. & Edinger Ave	%	2.0%								3.1%		7.1%		12.2%
	AM	1								1		2		4
	PM	-1								-1		-2		-3
27. Gothard St & Edinger Ave	%	1.0%							3.0%	8.1%	3.0%	9.2%		24.3%
	AM	0							1	3	1	3		9
	PM	0							-1	-2	-1	-2		-6
28. Beach Blvd & Edinger Ave	%			14.1%		8.0%		9.6%						31.7%
	AM			5		3		3						11
	PM			-4		-2		-2						-8
29. Newland St & Edinger Ave	%			3.3%		4.5%		.						7.8%
	AM			1		2								3
	PM			-1		-1								-2
36. Gothard St & Heil Ave	%								6.5%		3.5%			10.0%
	AM								2		1			4
	PM								-2		-1			-3
37. Beach Blvd & Heil Ave	%					.			7.5%					7.5%
	AM								3					3
	PM								-2					-2
38. Newland St & Heil Ave	%					.		0.9%						0.9%
	AM							0						0
	PM							0						0
46. Gothard St & Warner Ave	%						1.0%		4.1%		.			5.1%
	AM						0		1					2
	PM						0		-1					-1
47. Beach Blvd & Warner Ave	%						0.8%		5.7%		1.0%			7.5%
	AM						0		2		0			3
	PM						0		-1		0			-2
48. Newland St & Warner Ave	%						.	0.6%						0.6%
	AM							0						0
	PM							0						0
250. Beach Blvd & McFadden Ave	%		12.4%	1.2%	3.0%	1.0%								17.6%
	AM		4	0	1	0								6
	PM		-3	0	-1	0								-5
251. Beach Blvd & Bolsa Ave	%		8.3%		2.7%								.	11.0%
	AM		3		1									4
	PM		-2		-1									-3
252. Beach Blvd & Hazard Ave	%		5.2%		1.6%								.	6.8%
	AM		2		1									2
	PM		-1		0									-2
253. Magnolia St & Edinger Ave	%					3.0%							.	3.0%
	AM					1								1
	PM					-1								-1
AM Out Volume													TOTAL	84
68													TOTAL	-62
PM Out Volume														
-68														
AM In Volume														
35														
PM In Volume														
-26														

Table D-6: The Village at Bella Terra Trip Distribution - GP Versus Proposed GPA Option 2

OUTBOUND		Southbound			Westbound			Northbound			Eastbound			
Intersection		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
8. Goldenwest St & Bolsa Ave	%							1.0%	4.5%	1.0%				6.5%
	AM							1	3	1				4
	PM							-1	-3	-1				-4
15. Goldenwest St & Mcfadden Ave	%					3.3%	5.5%	1.0%	1.0%					10.8%
	AM					2	4	1	1					7
	PM					-2	-4	-1	-1					-7
16. Gothard St & McFadden Ave	%							8.8%		2.2%				11.0%
	AM							6		1				7
	PM							-6		-1				-7
17. Gothard St & Center Ave	%				6.0%		10.0%		1.0%					17.0%
	AM				4		7		1					12
	PM				-4		-7		-1					-12
18. I-405 SB Ramps & Center Ave	%										6.0%	23.0%		29.0%
	AM										4	16		20
	PM										-4	-16		-20
19. Beach Blvd & Center Ave.	%										17.0%		6.0%	23.0%
	AM										12		4	16
	PM										-12		-4	-16
26. Goldenwest St. & Edinger Ave	%				3.1%	7.1%	2.0%							12.2%
	AM				2	5	1							8
	PM				-2	-5	-1							-8
27. Gothard St & Edinger Ave	%		3.0%	3.0%	8.1%	9.2%	1.0%							24.3%
	AM		2	2	6	6	1							17
	PM		-2	-2	-6	-6	-1							-17
28. Beach Blvd & Edinger Ave	%	4.0%	2.0%								12.1%	13.0%	6.6%	37.7%
	AM	3	1								8	9	4	26
	PM	-3	-1								-8	-9	-4	-26
29. Newland St & Edinger Ave	%										3.3%	4.5%		7.8%
	AM										2	3		5
	PM										-2	-3		-5
36. Gothard St & Heil Ave	%		6.5%	3.5%										10.0%
	AM		4	2										7
	PM		-4	-2										-7
37. Beach Blvd & Heil Ave	%	1.1%	7.5%											8.6%
	AM	1	5											6
	PM	-1	-5											-6
38. Newland St & Heil Ave	%												0.9%	0.9%
	AM												1	1
	PM												-1	-1
46. Gothard St & Warner Ave	%		4.1%	1.0%										5.1%
	AM		3	1										3
	PM		-3	-1										-3
47. Beach Blvd & Warner Ave	%	1.0%	5.7%											6.7%
	AM	1	4											5
	PM	-1	-4											-5
48. Newland St & Warner Ave	%												0.6%	0.6%
	AM												0	0
	PM												0	0
250. Beach Blvd & McFadden Ave	%								12.4%	3.0%	1.2%	1.0%		17.6%
	AM								8	2	1	1		12
	PM								-8	-2	-1	-1		-12
251. Beach Blvd & Bolsa Ave	%							.	8.3%	2.7%				11.0%
	AM								6	2				7
	PM								-6	-2				-7
252. Beach Blvd & Hazard Ave	%							.	5.2%	1.6%				6.8%
	AM								4	1				5
	PM								-4	-1				-5
253. Magnolia St & Edinger Ave	%							.				3.0%		3.0%
	AM											2		2
	PM											-2		-2
AM Out Volume														162
68														-162
PM Out Volume														
-68														
AM In Volume														
35														
PM In Volume														
-26														

Table D-7: The Village at Bella Terra Trip Distribution - GP Versus Alternative GPA

INBOUND		Southbound			Westbound			Northbound			Eastbound			
Intersection		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
8. Goldenwest St & Bolsa Ave	%		4.5%		1.0%								1.0%	6.5%
	AM		-1		0								0	-2
	PM		-5		-1								-1	-7
15. Goldenwest St & Mcfadden Ave	%	5.5%	1.0%									3.3%	1.0%	10.8%
	AM	-2	0									-1	0	-3
	PM	-6	-1									-4	-1	-12
16. Gothard St & McFadden Ave	%				2.2%								8.8%	11.0%
	AM				-1								-3	-3
	PM				-2								-10	-12
17. Gothard St & Center Ave	%	10.0%	1.0%							6.0%				17.0%
	AM	-3	0							-2				-5
	PM	-11	-1							-7				-19
18. I-405 SB Ramps & Center Ave	%			13.2%		15.8%								29.0%
	AM			-4		-5								-9
	PM			-15		-17								-32
19. Beach Blvd & Center Ave.	%		14.1%	15.8%										29.9%
	AM		-4	-5										-9
	PM		-16	-17										-33
26. Goldenwest St. & Edinger Ave	%	2.0%								3.1%		7.1%		12.2%
	AM	-1								-1		-2		-4
	PM	-2								-3		-8		-13
27. Gothard St & Edinger Ave	%	1.0%							3.0%	8.1%	3.0%	9.2%		24.3%
	AM	0							-1	-2	-1	-3		-7
	PM	-1							-3	-9	-3	-10		-27
28. Beach Blvd & Edinger Ave	%			14.1%		8.0%		9.6%						31.7%
	AM			-4		-2		-3						-10
	PM			-16		-9		-11						-35
29. Newland St & Edinger Ave	%			3.3%		4.5%		.						7.8%
	AM			-1		-1								-2
	PM			-4		-5								-9
36. Gothard St & Heil Ave	%								6.5%		3.5%			10.0%
	AM								-2		-1			-3
	PM								-7		-4			-11
37. Beach Blvd & Heil Ave	%					.			7.5%					7.5%
	AM								-2					-2
	PM								-8					-8
38. Newland St & Heil Ave	%					.		0.9%						0.9%
	AM							0						0
	PM							-1						-1
46. Gothard St & Warner Ave	%						1.0%		4.1%		.			5.1%
	AM						0		-1					-2
	PM						-1		-5					-6
47. Beach Blvd & Warner Ave	%						0.8%		5.7%		1.0%			7.5%
	AM						0		-2		0			-2
	PM						-1		-6		-1			-8
48. Newland St & Warner Ave	%						.	0.6%						0.6%
	AM							0						0
	PM							-1						-1
250. Beach Blvd & McFadden Ave	%		12.4%	1.2%	3.0%	1.0%								17.6%
	AM		-4	0	-1	0								-5
	PM		-14	-1	-3	-1								-19
251. Beach Blvd & Bolsa Ave	%		8.3%		2.7%								.	11.0%
	AM		-2		-1									-3
	PM		-9		-3									-12
252. Beach Blvd & Hazard Ave	%		5.2%		1.6%								.	6.8%
	AM		-2		0									-2
	PM		-6		-2									-7
253. Magnolia St & Edinger Ave	%					3.0%							.	3.0%
	AM					-1								-1
	PM					-3								-3
AM Out Volume													TOTAL	-72
27													TOTAL	-263
PM Out Volume														
-150														
AM In Volume														
-30														
PM In Volume														
-110														

Table D-8: The Village at Bella Terra Trip Distribution - GP Versus Alternative GPA

OUTBOUND		Southbound			Westbound			Northbound			Eastbound			
Intersection		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
8. Goldenwest St & Bolsa Ave	%							1.0%	4.5%	1.0%				6.5%
	AM							0	1	0				2
	PM							-2	-7	-2				-10
15. Goldenwest St & Mcfadden Ave	%					3.3%	5.5%	1.0%	1.0%					10.8%
	AM					1	1	0	0					3
	PM					-5	-8	-2	-2					-16
16. Gothard St & McFadden Ave	%							8.8%		2.2%				11.0%
	AM							2		1				3
	PM							-13		-3				-17
17. Gothard St & Center Ave	%				6.0%		10.0%		1.0%					17.0%
	AM				2		3		0					5
	PM				-9		-15		-2					-26
18. I-405 SB Ramps & Center Ave	%										6.0%	23.0%		29.0%
	AM										2	6		8
	PM										-9	-35		-44
19. Beach Blvd & Center Ave.	%										17.0%		6.0%	23.0%
	AM										5		2	6
	PM										-26		-9	-35
26. Goldenwest St. & Edinger Ave	%				3.1%	7.1%	2.0%							12.2%
	AM				1	2	1							3
	PM				-5	-11	-3							-18
27. Gothard St & Edinger Ave	%		3.0%	3.0%	8.1%	9.2%	1.0%							24.3%
	AM		1	1	2	2	0							7
	PM		-5	-5	-12	-14	-2							-36
28. Beach Blvd & Edinger Ave	%	4.0%	2.0%								12.1%	13.0%	6.6%	37.7%
	AM	1	1								3	4	2	10
	PM	-6	-3								-18	-20	-10	-57
29. Newland St & Edinger Ave	%										3.3%	4.5%		7.8%
	AM										1	1		2
	PM										-5	-7		-12
36. Gothard St & Heil Ave	%		6.5%	3.5%										10.0%
	AM		2	1										3
	PM		-10	-5										-15
37. Beach Blvd & Heil Ave	%	1.1%	7.5%											8.6%
	AM	0	2											2
	PM	-2	-11											-13
38. Newland St & Heil Ave	%												0.9%	0.9%
	AM												0	0
	PM												-1	-1
46. Gothard St & Warner Ave	%		4.1%	1.0%										5.1%
	AM		1	0										1
	PM		-6	-2										-8
47. Beach Blvd & Warner Ave	%	1.0%	5.7%											6.7%
	AM	0	2											2
	PM	-2	-9											-10
48. Newland St & Warner Ave	%												0.6%	0.6%
	AM												0	0
	PM												-1	-1
250. Beach Blvd & McFadden Ave	%								12.4%	3.0%	1.2%	1.0%		17.6%
	AM								3	1	0	0		5
	PM								-19	-5	-2	-2		-26
251. Beach Blvd & Bolsa Ave	%							.	8.3%	2.7%				11.0%
	AM								2	1				3
	PM								-12	-4				-17
252. Beach Blvd & Hazard Ave	%							.	5.2%	1.6%				6.8%
	AM								1	0				2
	PM								-8	-2				-10
253. Magnolia St & Edinger Ave	%							.				3.0%		3.0%
	AM											1		1
	PM											-5		-5
AM Out Volume														64
27														-357
PM Out Volume														
-150														
AM In Volume														
-30														
PM In Volume														
-110														

Table D-9

PROJECT ICU SUMMARY

LOCATION	AM/PM	Alt.	NS1			NS2			EW1			EW2			TOTAL
			Vol.	Cap.	V/C	Vol.	Cap.	V/C	Vol.	Cap.	V/C	Vol.	Cap.	V/C	ICU
8. Goldenwest & Bolsa	PM	GPA	12	5,100	0.24%	0	1,700	0.00%	0	5,100	0.00%	4	3,400	0.12%	0.35%
		Alt. GPA	9	5,100	0.18%	0	1,700	0.00%	0	5,100	0.00%	3	3,400	0.09%	0.26%
18. I-405 Ramps & Center	PM	GPA			0.00%	0	3,400	0.00%	16	1,700	0.94%	56	3,400	1.65%	2.59%
		Alt. GPA			0.00%	0	3,400	0.00%	11	1,700	0.65%	43	3,400	1.26%	1.91%
28. Beach & Edinger	PM	GPA	0	5,100	0.00%	11	3,400	0.32%	33	3,400	0.97%	29	5,100	0.57%	1.86%
		Alt. GPA	0	5,100	0.00%	8	3,400	0.24%	23	3,400	0.68%	22	5,100	0.43%	1.34%
37. Beach & Heil	PM	GPA	0	1,700	0.00%	20	6,800	0.29%	0	1,700	0.00%	0	3,400	0.00%	0.29%
		Alt. GPA	0	1,700	0.00%	14	6,800	0.21%	0	1,700	0.00%	0	3,400	0.00%	0.21%
47. Beach & Warner	PM	GPA	20	6,800	0.29%	3	3,400	0.09%	4	3,400	0.12%	0	5,100	0.00%	0.50%
		Alt. GPA	16	6,800	0.24%	2	3,400	0.06%	3	3,400	0.09%	0	5,100	0.00%	0.38%
47. Newland & Warner	PM	GPA	0	3,400	0.00%	0	1,700	0.00%	0	1,700	0.00%	0	3,400	0.00%	0.00%
		Alt. GPA	0	3,400	0.00%	0	1,700	0.00%	0	1,700	0.00%	0	3,400	0.00%	0.00%
250. Beach & McFadden	AM	GPA	0	3,400	0.00%	16	6,800	0.24%	3	3,400	0.09%	4	3,400	0.12%	0.44%
		Alt. GPA	0	3,400	0.00%	8	6,800	0.12%	2	3,400	0.06%	2	3,400	0.06%	0.24%
250. Beach & McFadden	PM	GPA	34	6,800	0.50%	0	3,400	0.00%	3	3,400	0.09%	11	3,400	0.32%	0.91%
		Alt. GPA	23	6,800	0.34%	0	3,400	0.00%	2	3,400	0.06%	8	3,400	0.24%	0.63%
251. Beach & Bolsa	AM	GPA	0	3,400	0.00%	11	6,800	0.16%	0	1,700	0.00%	0	3,400	0.00%	0.16%
		Alt. GPA	0	3,400	0.00%	5	6,800	0.07%	0	1,700	0.00%	0	3,400	0.00%	0.07%
251. Beach & Bolsa	PM	GPA	22	6,800	0.32%	0	3,400	0.00%	0	1,700	0.00%	0	3,400	0.00%	0.32%
		Alt. GPA	16	6,800	0.24%	0	3,400	0.00%	0	1,700	0.00%	0	3,400	0.00%	0.24%

Abbreviations:
NS1 – First north-south critical movement
NS2 – Second north-south critical movement
EW1 – First east-west critical movement
EW2 – Second east-west critical movement
GPA – General Plan Amendment
ALT. GPA – Alternative GPA
Vol. – volume
Cap. - capacity

Appendix E
STATE HIGHWAY SYSTEM ANALYSIS

Table E-1 2030 Freeway Volumes
Table E-2 2030 Freeway Weaving Section
Table E-3 CD Weaving Sections

HCM Calculations:
Mainline
Weaving Sections

Table E-1

2030 FREEWAY VOLUMES

SOUTHBOUND				NORTHBOUND			
LOCATION	**WEAVE**	**AM**	**PM**	**LOCATION**	**WEAVE**	**AM**	**PM**
Mainline at Westminster		**11,400**	**10,400**	**Mainline at Westminster**		**11,100**	**12,900**
Westminster SB On	On	760	1,030	Westminster (Willow Lane) NB Off	Off	160	200
I-405 SB Mainline *	Weave	**12,160**	**11,430**	**I-405 NB Mainline ***	Weave	**11,260**	**13,100**
Goldenwest SB CD Road Off	Off	830	1,120	Goldenwest Loop On	On	840	1,060
Goldenwest SB CD Road On	On	920	1,460	Bolsa Loop Off	Off	1,200	970
I-405 SB Mainline *	Weave	**12,250**	**11,770**	**I-405 NB Mainline ***	Weave	**11,620**	**13,010**
Beach SB CD Road Off	Off	1,180	1,570	Beach NB CD Road On	On	1,860	2,120
Beach SB CD Road On		590	1,040	Beach NB CD Road Off	Off	1,780	2,050
Edinger Direct SB On	On	1,080	980				
I-405 SB Mainline *	Weave	**12,740**	**12,220**	**I-405 NB Mainline ***	Weave	**11,540**	**12,940**
Magnolia SB Off	Off	270	1,140	Magnolia NB Direct On		250	260

* Mainline Volume Includes Weave Volume

Table E-2

FREEWAY WEAVING SECTIONS

NORTH OF GOLDENWEST - SB		**VOLUME**				**NORTH OF GOLDENWEST - NB**		**VOLUME**			
LOCATION	**Lanes**	**AM**	**(Proj.)**	**PM**	**(Proj.)**	LOCATION	**Lanes**	**AM**	**(Proj.)**	**PM**	**(Proj.)**
Mainline Through	5	10,570	17	9,280	47	Mainline Through	5	10,260	35	11,840	37
SB On-ramp (Westminster)	Aux.	680	0	930	0	To NB Off-ramp (Willow Lane)	Aux.	150	0	190	0
Goldenwest SB CD Road Off-ramp	Aux.	750	3	1,020	8	Goldenwest NB Loop On-ramp	Aux.	830	6	1,050	6
Ramp to Ramp	Aux.	80	0	100	0	Ramp to Ramp	Aux.	10	0	10	0
WEAVING DISTANCE	1750'					WEAVING DISTANCE	2150'				
TOTAL SB ON		760	0	1,030	0	TOTAL OFF		160	0	200	0
TOTAL SB OFF		830	3	1,120	8	TOTAL ON		840	6	1,060	6
TOTAL WEAVE SECTION		1,590	3	2,150	8	TOTAL WEAVE SECTION		1,000	6	1,260	6
TOTAL FWY SECTION VOLUME		12,160	20	11,430	55	TOTAL FWY SECTION VOLUME		11,260	41	13,100	43
NORTH OF BEACH - SB		**VOLUME**				**NORTH OF BEACH - NB**		VOLUME			
LOCATION	**Lanes**	**AM**	**(Proj.)**	**PM**	**(Proj.)**	**LOCATION**	**Lanes**	**AM**	**(Proj.)**	**PM**	**(Proj.)**
Mainline Through	5	10,150	0	8,740	0	Mainline Through	5	8,560	0	9,920	0
Goldenwest SB CD Road On-ramp	Aux.	830	0	1,380	0	Bolsa NB Loop Off-ramp	Aux.	1,100	0	860	0
Beach SB CD Road Off-ramp	Aux. + Opt.	1,090	17	1,490	47	Beach NB CD Road On-ramp	Aux. + Opt.	1,760	35	2,010	37
Ramp to Ramp	Aux.	90	0	80	0	Ramp to Ramp	Aux.	100	0	110	0
WEAVING DISTANCE	1150'					WEAVING DISTANCE	1750'				
TOTAL SB ON		920	0	1,460	0	TOTAL OFF		1,200	0	970	0
TOTAL SB OFF		1,180	17	1,570	47	TOTAL ON		1,860	35	2,120	37
TOTAL WEAVE SECTION		2,100	17	3,030	47	TOTAL WEAVE SECTION		3,060	35	3,090	37
TOTAL FWY SECTION VOLUME		12,250	17	11,770	47	TOTAL FWY SECTION VOLUME		11,620	35	13,010	37
SOUTH OF BEACH - SB		**VOLUME**				**SOUTH OF BEACH - NB**		VOLUME			
LOCATION	**Lanes**	**AM**	**(Proj.)**	**PM**	**(Proj.)**	**LOCATION**	**Lanes**	**AM**	**(Proj.)**	**PM**	**(Proj.)**
Mainline Through	5	11,390	15	10,100	16	Mainline Through	5	9,510	0	10,630	0
Edinger Direct SB On-ramp	Aux.	1,050	23	900	24	Beach NB CD Road Off-ramp	Aux.	1,710	19	1,980	52
Magnolia SB Off-ramp	Aux.	240	0	1,060	0	Magnolia NB Direct On-ramp	Aux.	180	0	190	0
Ramp to Ramp	Aux.	30	0	80	0	Ramp to Ramp	Aux.	70	0	70	0
WEAVING DISTANCE	2400'					WEAVING DISTANCE	2000'				
TOTAL OFF		1,080	23	980	24	TOTAL OFF		1,780	19	2,050	52
TOTAL ON		270	0	1,140	0	TOTAL ON		250	0	260	0
TOTAL WEAVE SECTION		1,350	23	2,120	24	TOTAL WEAVE SECTION		2,030	19	2,310	52
TOTAL FWY SECTION VOLUME		12,740	38	12,220	40	TOTAL FWY SECTION VOLUME		11,540	19	12,940	52

Note: All volumes exclusive of HOV lane volumes

Table E-3

CD WEAVING SECTIONS

BEACH SB CD ROAD		VOLUME			
LOCATION	Lanes	AM	Proj.	PM	Proj.
SB On-ramp from Center Ave	1	650	15	1,190	16
SB Off-ramp to Beach NB	1	170	0	370	0
TOTAL		820	15	1,560	16
VOLUME/CAPACITY	2	0.46	0.01	0.87	0.01

BEACH NB CD ROAD		VOLUME			
LOCATION	Lanes	AM	Proj.	PM	Proj.
NB On-ramp from Beach NB	1	1,510	35	1,720	37
NB Off-ramp to Beach SB	1	840	19	1,040	52
TOTAL		2,350	54	2,760	89
VOLUME/CAPACITY	2	1.94	0.03	1.53	0.05

Note: Capacity is 1,800 vehicles per hour (900 per lane)

HCS2000: Basic Freeway Segments Release 4.1f

Joe Foust
Austin-Foust Associates, Inc.

Phone: Fax:
E-mail:

_____Operational Analysis_____

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-405 SB
From/To:	North of Goldenwest
Jurisdiction:	
Analysis Year:	No Project
Description:	

_____Flow Inputs and Adjustments_____

Volume, V	11400	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	3167	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2559	pc/h/ln

_____Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

_____LOS and Performance Measures_____

Flow rate, vp	2559	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	5	
Density, D		pc/mi/ln

Level of service, LOS	F

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1f

Joe Foust
Austin-Foust Associates, Inc.

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-405 SB
From/To:	North of Goldenwest
Jurisdiction:	
Analysis Year:	No Project
Description:	

Flow Inputs and Adjustments

Volume, V	10400	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	2889	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2334	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2334	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	52.8	mi/h
Number of lanes, N	5	
Density, D	44.2	pc/mi/ln

Level of service, LOS	E

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1f

Joe Foust
Austin-Foust Associates, Inc.

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-405 NB
From/To:	North of Goldenwest
Jurisdiction:	
Analysis Year:	No Project
Description:	

Flow Inputs and Adjustments

Volume, V	10420	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	2894	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2339	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2339	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	52.6	mi/h
Number of lanes, N	5	
Density, D	44.4	pc/mi/ln

Level of service, LOS	E

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1f

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Operational Analysis

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-405 NB
From/To:	North of Goldenwest
Jurisdiction:	
Analysis Year:	No Project
Description:	

Flow Inputs and Adjustments

Volume, V	12040	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	3344	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2702	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2702	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	5	
Density, D		pc/mi/ln

Level of service, LOS	F

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1f

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Operational Analysis

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-405 SB
From/To:	North of Beach
Jurisdiction:	
Analysis Year:	No Project
Description:	

Flow Inputs and Adjustments

Volume, V	11330	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	3147	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2543	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2543	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	5	
Density, D		pc/mi/ln

Level of service, LOS	F

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1f

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Operational Analysis

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-405 SB
From/To:	North of Beach
Jurisdiction:	
Analysis Year:	No Project
Description:	

Flow Inputs and Adjustments

Volume, V	10310	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	2864	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2314	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2314	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	53.5	mi/h
Number of lanes, N	5	
Density, D	43.2	pc/mi/ln

Level of service, LOS	E

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1f

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Operational Analysis

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-405 NB
From/To:	North of Beach
Jurisdiction:	
Analysis Year:	No Project
Description:	

Flow Inputs and Adjustments

Volume, V	9760	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	2711	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2191	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2191	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	57.3	mi/h
Number of lanes, N	5	
Density, D	38.2	pc/mi/ln

Level of service, LOS	E

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1f

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Operational Analysis

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-405 NB
From/To:	North of Beach
Jurisdiction:	
Analysis Year:	No Project
Description:	

Flow Inputs and Adjustments

Volume, V	10890	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	3025	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2444	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2444	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	5	
Density, D		pc/mi/ln

Level of service, LOS	F

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1f

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Operational Analysis

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-405 SB
From/To:	South of Beach
Jurisdiction:	
Analysis Year:	No Project
Description:	

Flow Inputs and Adjustments

Volume, V	11660	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	3239	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2617	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2617	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	5	
Density, D		pc/mi/ln

Level of service, LOS	F

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1f

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Operational Analysis

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-405 SB
From/To:	South of Beach
Jurisdiction:	
Analysis Year:	No Project
Description:	

Flow Inputs and Adjustments

Volume, V	11240	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	3122	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2523	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2523	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	5	
Density, D		pc/mi/ln

Level of service, LOS	F

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1f

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Operational Analysis

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-405 NB
From/To:	South of Beach
Jurisdiction:	
Analysis Year:	No Project
Description:	

Flow Inputs and Adjustments

Volume, V	11290	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	3136	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2534	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2534	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	5	
Density, D		pc/mi/ln

Level of service, LOS	F

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1f

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Operational Analysis

Analyst:	
Agency or Company:	
Date Performed:	6/24/2008
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-405 NB
From/To:	South of Beach
Jurisdiction:	
Analysis Year:	No Project
Description:	

Flow Inputs and Adjustments

Volume, V	12680	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	3522	v
Trucks and buses	2	%
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	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2846	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	5	
Free-flow speed:	Measured	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2846	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	5	
Density, D		pc/mi/ln

Level of service, LOS F

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Freeway Weaving Release 4.1

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Operational Analysis

Analyst:
Agency/Co.:
Date Performed: 6/27/2008
Analysis Time Period: AM
Freeway/dir or Travel: North Bound 405
Weaving Location: South of Beach
Jurisdiction:
Analysis Year: 2030
Description: HBfreeway

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	5	
Weaving segment length, L	2000	ft
Terrain type	Level	
Grade	%	
Length	mi	
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.20	
Weaving ratio, R	0.10	

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	V B-D	Weaving V A-D	V B-C	
Volume, V	7608	70	1710	180	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	2113	19	475	50	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	8537	78	1919	202	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	2.03	0.30
Weaving and non-weaving speeds, Si	33.15	57.47
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)	1.65	
Maximum number of lanes, Nw (max) (Exhibit 24-7)	1.40	
Type of operation is	Constrained	

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	50.20	mph
Weaving segment density, D	42.78	pc/mi/ln
Level of service, LOS	E	
Capacity for base condition, cb	10778	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded See Note Maximum	Note
Weaving flow rate, Vw	2121	2800	a
Average flow rate (pcphpl)	2147	2350	b
Volume ratio, VR	0.20	0.20	c
Weaving ratio, R	0.10	N/A	d
Weaving length (ft)	2000	2500	e

Notes:

a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
d. Breakdown may occur in some cases for Type C segments.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 25, HCS Ramps.)

HCS2000: Freeway Weaving Release 4.1

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Operational Analysis

Analyst:
Agency/Co.:
Date Performed: 6/27/2008
Analysis Time Period: AM
Freeway/dir or Travel: North Bound 405
Weaving Location: North of GOLDENWEST
Jurisdiction:
Analysis Year: 2030
Description: HBfreeway

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	5	
Weaving segment length, L	2150	ft
Terrain type	Level	
Grade	%	
Length	mi	
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.11	
Weaving ratio, R	0.15	

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	V B-D	Weaving V A-D	V B-C	
Volume, V	8208	10	150	830	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	2280	3	42	231	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	9211	11	168	931	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.66	0.34
Weaving and non-weaving speeds, Si	48.05	56.09

Number of lanes required for
unconstrained operation, Nw (Exhibit 24-7) 1.14
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 55.11 mph
Weaving segment density, D 37.46 pc/mi/ln
Level of service, LOS E
Capacity for base condition, cb 11522 pc/h

Limitations on Weaving Segments

	Analyzed	Maximum	If Max Exceeded See Note Note
Weaving flow rate, Vw	1099	2800	a
Average flow rate (pcphpl)	2064	2350	b
Volume ratio, VR	0.11	0.20	c
Weaving ratio, R	0.15	N/A	d
Weaving length (ft)	2150	2500	e

Notes:
a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
d. Breakdown may occur in some cases for Type C segments.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 25, HCS Ramps.)

HCS2000: Freeway Weaving Release 4.1

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Operational Analysis

Analyst:
Agency/Co.:
Date Performed: 6/27/2008
Analysis Time Period: AM
Freeway/dir or Travel: North Bound 405
Weaving Location: North of Beach
Jurisdiction:
Analysis Year: 2030
Description: HBfreeway

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	5	
Weaving segment length, L	1750	ft
Terrain type	Level	
Grade	%	
Length	mi	
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.29	
Weaving ratio, R	0.38	

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V	6848	100	1100	1760	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	1902	28	306	489	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	7684	112	1234	1975	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.73	0.49
Weaving and non-weaving speeds, Si	46.71	51.95
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)	1.65	
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50	
Type of operation is	Unconstrained	

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	50.30 mph
Weaving segment density, D	43.75 pc/mi/ln
Level of service, LOS	F
Capacity for base condition, cb	11302 pc/h

Limitations on Weaving Segments

	Analyzed	Maximum	If Max Exceeded See Note Note
Weaving flow rate, Vw	3209	4000	a
Average flow rate (pcphpl)	2201	2350	b
Volume ratio, VR	0.29	0.80	c
Weaving ratio, R	0.38	N/A	d
Weaving length (ft)	1750	2500	e

Notes:

a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
d. Breakdown may occur in some cases for Type C segments.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 25, HCS Ramps.)

HCS2000: Freeway Weaving Release 4.1

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Operational Analysis

Analyst:	
Agency/Co.:	
Date Performed:	6/27/2008
Analysis Time Period:	AM
Freeway/dir or Travel:	South Bound 405
Weaving Location:	North of BEACH
Jurisdiction:	
Analysis Year:	2030
Description:	HBfreeway

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	5	
Weaving segment length, L	1150	ft
Terrain type	Level	
Grade	%	
Length	mi	
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.19	
Weaving ratio, R	0.43	

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V	8120	90	1090	830	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	2256	25	303	231	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	9112	101	1223	931	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.77	0.38
Weaving and non-weaving speeds, Si	46.02	54.86

Number of lanes required for
unconstrained operation, Nw (Exhibit 24-7) 1.32
Maximum number of lanes, Nw (max) (Exhibit 24-7) 3.50
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 52.93 mph
Weaving segment density, D 42.95 pc/mi/ln
Level of service, LOS E
Capacity for base condition, cb 11302 pc/h

Limitations on Weaving Segments

	Analyzed	Maximum	If Max Exceeded See Note Note
Weaving flow rate, Vw	2154	4000	a
Average flow rate (pcphpl)	2273	2350	b
Volume ratio, VR	0.19	0.80	c
Weaving ratio, R	0.43	N/A	d
Weaving length (ft)	1150	2500	e

Notes:
a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
d. Breakdown may occur in some cases for Type C segments.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 25, HCS Ramps.)

HCS2000: Freeway Weaving Release 4.1

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Operational Analysis

Analyst:
Agency/Co.:
Date Performed: 6/27/2008
Analysis Time Period: AM
Freeway/dir or Travel: South Bound 405
Weaving Location: North of GOLDENWEST
Jurisdiction:
Analysis Year: 2030
Description: HBfreeway

Inputs

Freeway free-flow speed, SFF 65 mph
Weaving number of lanes, N 5
Weaving segment length, L 1750 ft
Terrain type Level
Grade %
Length mi
Weaving type A Multilane or C-D
Volume ratio, VR 0.14
Weaving ratio, R 0.48

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	V B-D	Weaving V A-D	V B-C	
Volume, V	8456	80	750	680	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	2349	22	208	189	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	9489	89	841	763	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.91	0.50
Weaving and non-weaving speeds, Si	43.80	51.66

Number of lanes required for
unconstrained operation, Nw (Exhibit 24-7) 1.34
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 50.37 mph
Weaving segment density, D 44.40 pc/mi/ln
Level of service, LOS F
Capacity for base condition, cb 10950 pc/h

Limitations on Weaving Segments

	Analyzed	Maximum	If Max Exceeded See Note Note
Weaving flow rate, Vw	1604	2800	a
Average flow rate (pcphpl)	2236	2350	b
Volume ratio, VR	0.14	0.20	c
Weaving ratio, R	0.48	N/A	d
Weaving length (ft)	1750	2500	e

Notes:
a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
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HCS2000: Freeway Weaving Release 4.1

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Operational Analysis

Analyst:
Agency/Co.:
Date Performed: 6/27/2008
Analysis Time Period: AM
Freeway/dir or Travel: South Bound 405
Weaving Location: South of BEACH
Jurisdiction:
Analysis Year: 2030
Description: HBfreeway

Inputs

Freeway free-flow speed, SFF 65 mph
Weaving number of lanes, N 5
Weaving segment length, L 2400 ft
Terrain type Level
Grade %
Length mi
Weaving type A Multilane or C-D
Volume ratio, VR 0.12
Weaving ratio, R 0.19

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V	9112	30	240	1050	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	2531	8	67	292	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	10225	33	269	1178	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.71	0.39
Weaving and non-weaving speeds, Si	47.15	54.55

Number of lanes required for
unconstrained operation, Nw (Exhibit 24-7) 1.28
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 53.52 mph
Weaving segment density, D 43.74 pc/mi/ln
Level of service, LOS F
Capacity for base condition, cb 11539 pc/h

Limitations on Weaving Segments

	Analyzed	Maximum	If Max Exceeded See Note Note
Weaving flow rate, Vw	1447	2800	a
Average flow rate (pcphpl)	2341	2350	b
Volume ratio, VR	0.12	0.20	c
Weaving ratio, R	0.19	N/A	d
Weaving length (ft)	2400	2500	e

Notes:
a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
d. Breakdown may occur in some cases for Type C segments.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 25, HCS Ramps.)

HCS2000: Freeway Weaving Release 4.1

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Operational Analysis

Analyst:
Agency/Co.:
Date Performed: 6/27/2008
Analysis Time Period: PM
Freeway/dir or Travel: North Bound 405
Weaving Location: North of Beach
Jurisdiction:
Analysis Year: 2030
Description: HBfreeway

Inputs

Freeway free-flow speed, SFF 65 mph
Weaving number of lanes, N 5
Weaving segment length, L 1750 ft
Terrain type Level
Grade %
Length mi
Weaving type B Multilane or C-D
Volume ratio, VR 0.26
Weaving ratio, R 0.30

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V	7936	110	860	2010	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	2204	31	239	558	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	8905	123	965	2255	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.75	0.48
Weaving and non-weaving speeds, Si	46.37	52.28
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)	1.49	
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50	
Type of operation is	Unconstrained	

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	50.59 mph
Weaving segment density, D	48.42 pc/mi/ln
Level of service, LOS	F
Capacity for base condition, cb	11411 pc/h

Limitations on Weaving Segments

	Analyzed	Maximum	If Max Exceeded See Note Note
Weaving flow rate, Vw	3220	4000	a
Average flow rate (pcphpl)	2449	2350	b
Volume ratio, VR	0.26	0.80	c
Weaving ratio, R	0.30	N/A	d
Weaving length (ft)	1750	2500	e

Notes:

a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
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e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 25, HCS Ramps.)

HCS2000: Freeway Weaving Release 4.1

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Operational Analysis

Analyst:
Agency/Co.:
Date Performed: 6/27/2008
Analysis Time Period: PM
Freeway/dir or Travel: North Bound 405
Weaving Location: North of GOLDENWEST
Jurisdiction:
Analysis Year: 2030
Description: HBfreeway

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	5	
Weaving segment length, L	2150	ft
Terrain type	Level	
Grade	%	
Length	mi	
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.12	
Weaving ratio, R	0.15	

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	V B-D	Weaving V A-D	V B-C	
Volume, V	9472	10	190	1050	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	2631	3	53	292	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	10629	11	213	1178	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.78	0.43
Weaving and non-weaving speeds, Si	45.82	53.54
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)	1.22	
Maximum number of lanes, Nw (max) (Exhibit 24-7)	1.40	
Type of operation is	Unconstrained	

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	52.52 mph
Weaving segment density, D	45.82 pc/mi/ln
Level of service, LOS	F
Capacity for base condition, cb	11457 pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded See Note Maximum	Note
Weaving flow rate, Vw	1391	2800	a
Average flow rate (pcphpl)	2406	2350	b
Volume ratio, VR	0.12	0.20	c
Weaving ratio, R	0.15	N/A	d
Weaving length (ft)	2150	2500	e

Notes:

a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
d. Breakdown may occur in some cases for Type C segments.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 25, HCS Ramps.)

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Operational Analysis

Analyst:	
Agency/Co.:	
Date Performed:	6/27/2008
Analysis Time Period:	PM
Freeway/dir or Travel:	North Bound 405
Weaving Location:	South of Beach
Jurisdiction:	
Analysis Year:	2030
Description:	HBfreeway

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	5	
Weaving segment length, L	2000	ft
Terrain type	Level	
Grade	%	
Length	mi	
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.20	
Weaving ratio, R	0.09	

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V	8504	70	1980	190	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	2362	19	550	53	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	9543	78	2222	213	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	2.29	0.35
Weaving and non-weaving speeds, Si	31.72	55.80
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)	1.70	
Maximum number of lanes, Nw (max) (Exhibit 24-7)	1.40	
Type of operation is	Constrained	

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	48.38 mph
Weaving segment density, D	49.84 pc/mi/ln
Level of service, LOS	F
Capacity for base condition, cb	10760 pc/h

Limitations on Weaving Segments

	Analyzed	Maximum	If Max Exceeded See Note Note
Weaving flow rate, Vw	2435	2800	a
Average flow rate (pcphpl)	2411	2350	b
Volume ratio, VR	0.20	0.20	c
Weaving ratio, R	0.09	N/A	d
Weaving length (ft)	2000	2500	e

Notes:

a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
d. Breakdown may occur in some cases for Type C segments.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 25, HCS Ramps.)

HCS2000: Freeway Weaving Release 4.1

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Operational Analysis

Analyst:
Agency/Co.:
Date Performed: 6/27/2008
Analysis Time Period: PM
Freeway/dir or Travel: South Bound 405
Weaving Location: North of BEACH
Jurisdiction:
Analysis Year: 2030
Description: HBfreeway

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	5	
Weaving segment length, L	1150	ft
Terrain type	Level	
Grade	%	
Length	mi	
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.29	
Weaving ratio, R	0.48	

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V	6992	80	1490	1380	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	1942	22	414	383	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	7846	89	1672	1548	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.91	0.60
Weaving and non-weaving speeds, Si	43.80	49.32
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)	1.96	
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50	
Type of operation is	Unconstrained	

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	47.59 mph
Weaving segment density, D	46.88 pc/mi/ln
Level of service, LOS	F
Capacity for base condition, cb	10663 pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded See Note Maximum	Note
Weaving flow rate, Vw	3220	4000	a
Average flow rate (pcphpl)	2231	2350	b
Volume ratio, VR	0.29	0.80	c
Weaving ratio, R	0.48	N/A	d
Weaving length (ft)	1150	2500	e

Notes:

a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
d. Breakdown may occur in some cases for Type C segments.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 25, HCS Ramps.)

HCS2000: Freeway Weaving Release 4.1

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Operational Analysis

Analyst:
Agency/Co.:
Date Performed: 6/27/2008
Analysis Time Period: PM
Freeway/dir or Travel: South Bound 405
Weaving Location: North of GOLDENWEST
Jurisdiction:
Analysis Year: 2030
Description: HBfreeway

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	5	
Weaving segment length, L	1750	ft
Terrain type	Level	
Grade	%	
Length	mi	
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.21	
Weaving ratio, R	0.48	

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V	7424	100	1020	930	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	2062	28	283	258	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	8331	112	1144	1043	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	2.27	0.33
Weaving and non-weaving speeds, Si	31.82	56.33
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)	1.66	
Maximum number of lanes, Nw (max) (Exhibit 24-7)	1.40	
Type of operation is	Constrained	

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	48.62	mph
Weaving segment density, D	43.73	pc/mi/ln
Level of service, LOS	F	
Capacity for base condition, cb	10540	pc/h

Limitations on Weaving Segments

	Analyzed	Maximum	If Max Exceeded See Note Note
Weaving flow rate, Vw	2187	2800	a
Average flow rate (pcphpl)	2126	2350	b
Volume ratio, VR	0.21	0.20	c
Weaving ratio, R	0.48	N/A	d
Weaving length (ft)	1750	2500	e

Notes:

a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
d. Breakdown may occur in some cases for Type C segments.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 25, HCS Ramps.)

HCS2000: Freeway Weaving Release 4.1

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Operational Analysis

Analyst:
Agency/Co.:
Date Performed: 6/27/2008
Analysis Time Period: PM
Freeway/dir or Travel: South Bound 405
Weaving Location: South of BEACH
Jurisdiction:
Analysis Year: 2030
Description: HBfreeway

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	5	
Weaving segment length, L	2400	ft
Terrain type	Level	
Grade	%	
Length	mi	
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.19	
Weaving ratio, R	0.46	

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V	8080	80	1060	900	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	2244	22	294	250	v
Trucks and buses	2	2	2	2	%
Recreational vehicles	0	0	0	0	%
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	0.990	0.990	0.990	0.990	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	9067	89	1189	1010	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	1.84	0.27
Weaving and non-weaving speeds, Si	34.37	58.20
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)	1.68	
Maximum number of lanes, Nw (max) (Exhibit 24-7)	1.40	
Type of operation is	Constrained	

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	51.31	mph
Weaving segment density, D	44.26	pc/mi/ln
Level of service, LOS	F	
Capacity for base condition, cb	11067	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded See Note Maximum	Note
Weaving flow rate, Vw	2199	2800	a
Average flow rate (pcphpl)	2271	2350	b
Volume ratio, VR	0.19	0.20	c
Weaving ratio, R	0.46	N/A	d
Weaving length (ft)	2400	2500	e

Notes:

a. Capacity constrained by maximum allowable weaving flow rate.
b. Capacity constrained by basic freeway capacity.
c. Segments do not operate well at VR's exceeding max. Poor operations and some local queuing are expected in such cases.
d. Breakdown may occur in some cases for Type C segments.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 25, HCS Ramps.)