

Submitted by:



CITY OF RIALTO
TRANSPORTATION/TRAFFIC IMPACT FEE
Nexus Study

Submitted to:
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EXECUTIVE SUMMARY

This Traffic Impact Fee Nexus Study describes the methodology and summarizes the results of a study conducted by Iteris, Inc. (Iteris) to update the current Traffic Impact Fee (also known as the Development Impact Fee) Program for the City of Rialto. The purpose of the Traffic Impact Fee is to collect funds for transportation infrastructure improvements aimed to relieve projected mobility deficiencies and unacceptable traffic operating conditions expected to exist as a result of the new developments within Rialto, per buildout of the City's General Plan. This report identifies the purpose of the fee and demonstrates a reasonable relationship ("nexus") between the fee and the purpose for which it is to be collected, thus satisfying the requirements of the California Mitigation Fee Act.

The net final total cost to improve the City's transportation system is estimated at \$72,747,502. The Traffic Impact Fee was calculated by dividing the total costs of the transportation improvements by the 201,369 net daily trips which are projected to be generated by new development within the City by year 2040. The maximum nexus fee as a result of the projected new daily trips is \$361.27 per generated daily trip. This Nexus Fee Study only recommends this maximum fee per trip that by state law nexus is connected to and can be assessed to new development. The staff report, which will be drafted for consideration by the City Council based on the results of this study, will recommend the parameters of the actual updated traffic impact fee program. The final traffic impact fee for a project is typically a one-time fee, calculated prior to project approval, and collected at the time of building permit issuance.



1.0 INTRODUCTION

The purpose of this traffic impact fee nexus study is to describe the methodology used and summarize the results of a study conducted by Iteris, Inc. (Iteris) to update the current Traffic Impact Fee (also known as the Development Impact Fee) in the City of Rialto. The Traffic Impact Fee is intended to collect funds for transportation infrastructure improvements aimed at relieving projected transportation deficiencies and unacceptable traffic operating conditions forecast to be caused by new development within Rialto, per build out of the City's General Plan. This report identifies the purpose of the fee and demonstrates a reasonable relationship (nexus) between the fee and the purpose for which it is to be collected.

1.1 BACKGROUND

The City of Rialto currently administers a regional traffic impact development fee, which was established as part of Resolution 5427, Ordinance 1532. The current fees are as follows:

- Single-family Residential - \$3,533 per dwelling unit
- Multi-family Residential - \$2,448 per dwelling unit
- Retail - \$8.08 per square foot
- Office - \$4.87 per square foot
- Industrial - \$2.80 per square foot

The City must comply with California Government Code Section 66000 and as part of the code, the City is required to make certain findings via a nexus study in order to establish a valid local traffic impact fee.

1.2 CALIFORNIA MITIGATION FEE ACT

New development lays the groundwork for population increases and job opportunities within the City. However, as population and employment increase, the need for planning and implementing circulation system improvements also increases.

California Government Code Section 66000 et seq. enables local agencies to charge a mitigation fee. A mitigation fee, also known as a development impact fee, is a monetary exaction imposed by a government agency upon an applicant seeking approval for a development project. The fee is applied towards the cost of traffic-related public infrastructure improvements within the jurisdiction, and is not a tax or special assessment. The fee is to be used to finance only those circulation system improvements which are related to the type of development that will generate an increase in traffic.

The Mitigation Fee Act requirements in California Government Code Section 66001 require specific nexus requirements to be satisfied for fees related to traffic mitigation improvements. These requirements include:

66001. (a) In any action establishing, increasing, or imposing a fee as a condition of approval of a development project by a local agency, the local agency shall do all of the following:
- (1) Identify the purpose of the fee.
 - (2) Identify the use to which the fee is to be put. If the use is financing public facilities, the facilities shall be identified. That identification may, but need not, be made by reference to a capital improvement plan as specified in Section 65403 or 66002, may be made in applicable general or specific plan requirements, or may be made in other public documents that identify the public facilities for which the fee is charged.
 - (3) Determine how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.
 - (4) Determine how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.

Appendix A includes a complete version of California Government Code Section 66000-66008.

2.0 TRAVEL DEMAND FORECASTING

This section presents the methodologies that Iteris applied to develop future traffic conditions for the study area. San Bernardino Association of Governments (SANBAG) is the countywide planning agency responsible for developing and reviewing land use forecasts on behalf of the Southern California Association of Governments (SCAG). The process used to develop land use forecasts involved approval of residential and non-residential development capacities for each specific plan area controlling the growth increments. These specific plan growth capacities were obtained from approved specific plans, through coordination with City staff. Specific plan growth capacities were then allocated to the



Transportation Analysis Zones (TAZ's) within each specific plan area, and based upon each TAZ's proportionate share of acreage as a percentage of the total acreage of each specific plan area.

SANBAG has developed the San Bernardino County Transportation Analysis Model (SBTAM) based on SCAG Regional Transportation Plan (RTP) model. SBTAM analysis years

currently include a base year of 2008 and a horizon year of 2035. The SBTAM was used as a base model in the development of the City of Rialto focused model. The purpose of this section is to present the land use and circulation assumptions of the SBTAM within the City of Rialto.

As part of this fee update study, an updated base year 2012 model scenario was created to supplant the 2008 data currently in the model, using updated land use data obtained from SANBAG. The updated base year model was created in order to more accurately estimate the growth in vehicle trips between current conditions (at the time of the study) and projected buildout conditions. In addition, an updated 2040 model scenario was created to supplant the 2035 data currently in the model. **Table 1** summarizes the calculation of net daily trips using the SBTAM scenarios.

TABLE 1: TOTAL GENERATED TRIPS

Year	Total Daily Trips (All uses)	Total Daily Trips (Non-exempt uses)
Base Year 2012	365,686	323,311
Future Year 2040	589,403	524,680
Net Growth	223,717	201,369

As shown in **Table 1**, the projected total increase in daily trips as a result of new development in the City of Rialto between model years 2012 and 2040 is estimated at 223,717 daily trips. This number represents the total trip difference between City TAZs in the two model year scenarios, and includes contributions from all land uses. Of the net new daily trips, approximately 10% are attributable to public schools (K through 12, and college) which are typically considered exempt from local planning regulations, and thus exempt from paying their share of the traffic impact fee. It is assumed that their share of the fee would be endured by new development. Based on the trips generated by non-exempt uses only, the net projected increase in daily trips to be used in the final trip fee calculation would be reduced to 201,369 daily trips.

2.1 FUTURE VOLUME DEVELOPMENT

Future year forecast volumes, both daily and peak hour, were post-processed consistent with standard methodology applied for forecast volumes obtained from various travel demand models throughout Caltrans District 8. The post-processing methodology compares the existing base year model and future year model forecast volumes and applies the ratio or incremental difference between the forecasts to the existing traffic count volume. This methodology is consistent with methodologies applied by SCAG and other applications of the SCAG regional model.

3.0 TRAFFIC ANALYSIS METHODOLOGY

Intersections are typically considered to represent the most critical locations for traffic flow bottlenecks and general congestion on roadways. Conflicting traffic movements are created at intersections since the right-of-way must be shared by opposing traffic streams. For purposes of this study, intersection level of service (LOS) is measured to determine the peak hour operating conditions at the study intersections. **Table 2** outlines the LOS concept for signalized intersections using the Highway Capacity Manual (HCM) delay methodology, which is described in the Highway Capacity Manual, Special Report 209 (Transportation Research Board, Washington, D.C., 2000). Under the HCM methodology, LOS at signalized intersections is based on the average delay experienced by vehicles traveling through an intersection. The analysis incorporates the effects of the lane geometry and signal phasing (e.g., protected or permitted left turns) at the intersection.

TABLE 2: SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Signalized Intersection Delay (seconds per vehicle)
A	Free flowing, virtually no delay. Minimal Traffic.	≤ 10
B	Free flow and choice of lanes. Delays are minimal. All cars clear intersection easily.	>10 and ≤ 20
C	Good operation. Delays starting to become a factor but still within acceptable limits.	>20 and ≤ 35
D	Approaching unstable flow. Queues at intersection are quite long but most cars clear intersection on their green signal. Occasionally, several vehicles must wait for a second green signal. Congestion is moderate.	>35 and ≤ 55
E	Severe Congestion and delay. Most of the available capacity is used. Many cars must wait through a complete signal cycle to clear the intersection.	>55 and ≤ 80
F	Excessive delay and congestion. Most cars must wait through more than one on one signal cycle. Queues are very long and drivers are obviously irritated.	> 80

Table 3 outlines the LOS concept for unsignalized intersections using the HCM methodology.

TABLE 3: UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Unsignalized Intersection Delay (seconds per vehicle)
A	Excellent operation. All approaches to the intersection appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation.	≤ 10
B	Very good operation. Many drivers begin to feel somewhat restricted within platoons of vehicles. This represents stable flow. An approach to an intersection may occasionally be fully utilized and traffic queues start to form.	>10 and ≤ 15
C	Good operation. Occasionally drivers may have to wait more than 60 seconds, and back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>15 and ≤ 25
D	Fair operation. Cars are sometimes required to wait more than 60 seconds during short peaks. There are no long-standing traffic queues.	>25 and ≤ 35
E	Poor operation. Some long-standing vehicular queues develop on critical approaches to intersections. Delays may be up to several minutes.	>35 and ≤ 50
F	Forced flow. Represents jammed conditions. Backups form locations downstream or on the cross street may restrict or prevent movement of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop and go type traffic flow.	> 50

Source: *Highway Capacity Manual*, Special Report 209, Transportation Research Board, Washington, DC, 2000.

The City of Rialto considers acceptable intersection operations as LOS D or better, applied during the General Plan process.

4.0 EXISTING CONDITIONS

This section presents the existing conditions LOS at the study intersections and roadway segments. Existing deficiencies must be identified and addressed as part of the program, but they cannot be funded by future development, so other funding mechanisms need to be explored to cover existing deficiencies.

The project study area includes fifty (50) key intersections throughout the City, developed in consultation with City staff. Peak hour traffic volumes were collected in May 2014 at 44 of the 50 intersections, with truck classification counts collected at eight of the 44 intersections. For the other six intersections, 2013 peak hour traffic volumes were used. Existing volumes provide a baseline to evaluate current



performance of the circulation system and are used as the basis of future forecast volumes through the post-processing routine. **Figure 1** shows the locations of the study intersections.

The existing a.m. and p.m. peak hour traffic volumes are provided in **Appendix B. Table 4** summarizes the existing LOS results at the study intersections. Detailed LOS calculation sheets are provided in **Appendix C**.

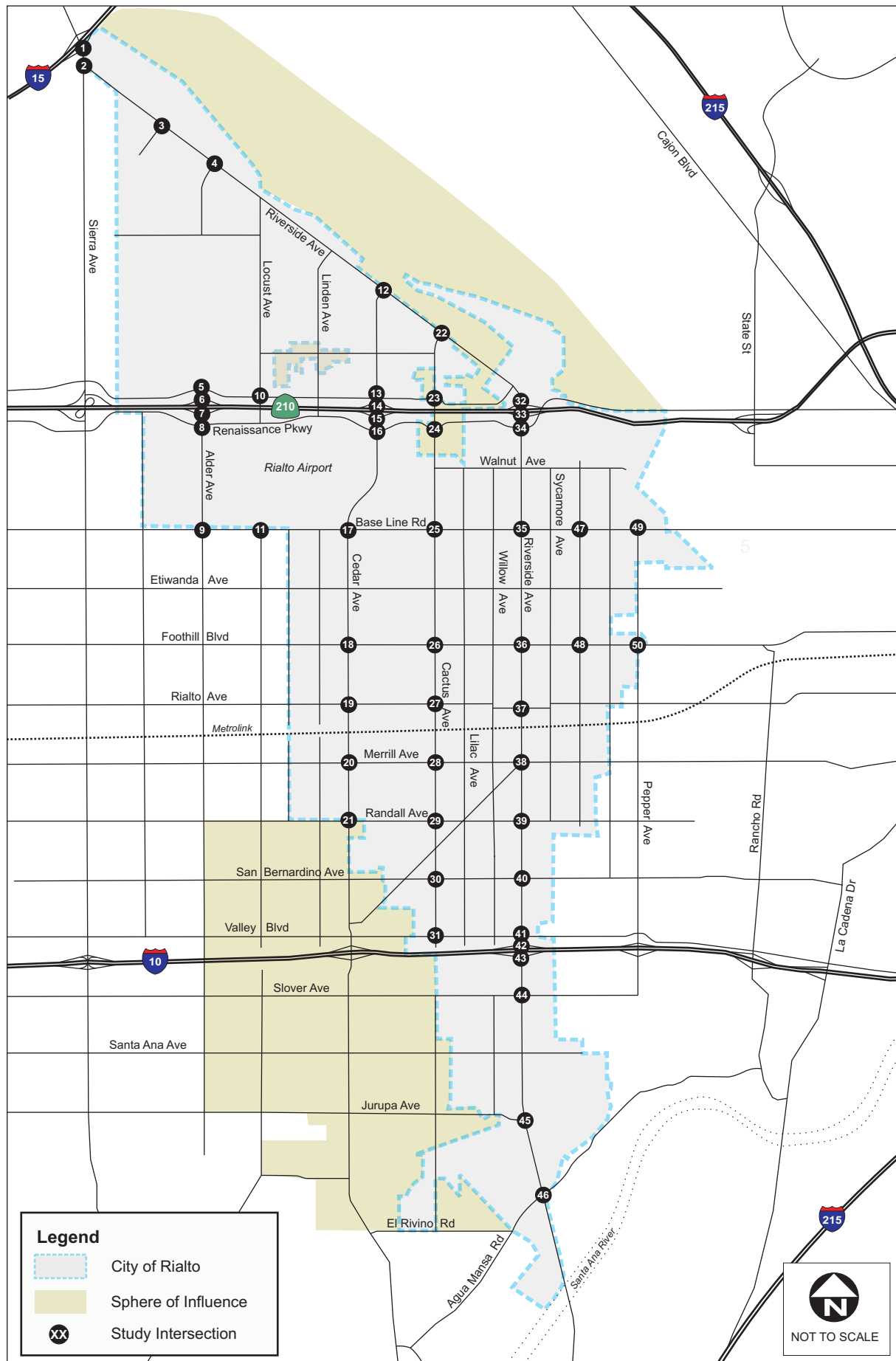


TABLE 4: EXISTING CONDITIONS - INTERSECTION LOS

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
1	Sierra Ave/I-15 NB Ramps	Stop-controlled	22.1	C	22.1	C
2	Sierra Ave/Riverside Ave	Stop-controlled	22.0	C	28.3	D
3	Live Oak Ave/Riverside Ave	Signal	13.0	B	9.1	A
4	Alder Ave/Riverside Ave	Signal	5.1	A	3.7	A
5	Alder Ave/Sierra Lakes Pkwy	Signal	10.7	B	8.4	A
6	Alder Ave/SR-210 WB Ramps	Signal	19.0	B	14.1	B
7	Alder Ave/SR-210 EB Ramps	Signal	12.7	B	16.2	B
8	Alder Ave/Renaissance Pkwy	Signal	18.2	B	16.3	B
9	Alder Ave/Base Line Rd	Signal	57.0	E	39.8	D
10	Locust Ave/Sierra Lakes Pkwy	Signal	14.4	B	19.5	B
11	Locust Ave/Base Line Rd	Stop-controlled	8.9	A	9.7	A
12	Ayala Dr/Riverside Ave*	Signal	9.1	A	7.6	A
13	Ayala Dr/Casmalia St	Signal	10.0	A	6.0	A
14	Ayala Dr/SR-210 WB Ramps	Signal	38.9	D	16.3	B
15	Ayala Dr/SR-210 EB Ramps	Signal	15.5	B	16.4	B
16	Ayala Dr/Renaissance Pkwy	Signal	21.5	C	22.0	C
17	Cedar Ave/Base Line Rd*	Signal	29.4	C	29.7	C
18	Cedar Ave/Foothill Blvd	Signal	30.4	C	33.6	C
19	Cedar Ave/Rialto Ave*	Signal	32.6	C	23.5	C
20	Cedar Ave/Merrill Ave	Signal	20.2	C	17.5	B
21	Cedar Ave/Randall Ave	Signal	10.5	B	11.1	B
22	Cactus Ave/Riverside Ave*	Signal	15.6	B	7.4	A
23	Cactus Ave/Casmalia St	Signal	14.7	B	8.4	A
24	Cactus Ave/Easton St	Stop-controlled	20.1	C	10.4	A
25	Cactus Ave/Base Line Rd*	Signal	45.4	D	26.5	C
26	Cactus Ave/Foothill Blvd	Signal	21.9	C	21.3	C
27	Cactus Ave/Rialto Ave	Signal	13.5	B	6.4	A
28	Cactus Ave/Merrill Ave	Signal	11.9	B	11.0	B
29	Cactus Ave/Randall Ave	Signal	11.8	B	10.7	B
30	Cactus Ave/San Bernardino Ave	Signal	19.5	C	10.8	B
31	Cactus Ave/Valley Blvd	Signal	12.9	B	7.9	A
32	Riverside Ave/SR-210 WB Ramps	Signal	30.5	C	21.7	C
33	Riverside Ave/SR-210 EB Ramps	Signal	17.7	B	18.8	B
34	Riverside Ave/Easton St	Signal	48.9	D	33.2	C
35	Riverside Ave/Base Line Rd*	Signal	36.9	D	36.4	D
36	Riverside Ave/Foothill Blvd	Signal	27.7	C	33.2	C

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
37	Riverside Ave/Rialto Ave*	Signal	22.3	C	23.3	C
38	Riverside Ave/Merrill Ave/Bloomington Ave*	Signal	30.2	C	41.6	D
39	Riverside Ave/Randall Ave	Signal	26.9	C	16.3	B
40	Riverside Ave/San Bernardino Ave*	Signal	31.0	C	33.1	C
41	Riverside Ave/Valley Blvd*	Signal	42.6	D	31.2	C
42	Riverside Ave/I-10 WB Ramps	Signal	17.7	B	16.3	B
43	Riverside Ave/I-10 EB Ramps	Signal	19.6	B	32.1	C
44	Riverside Ave/Slover Ave*	Signal	22.4	C	25.0	C
45	Riverside Ave/Jurupa Ave*	Signal	7.1	A	6.6	A
46	Riverside Ave/Agua Mansa Rd*	Signal	28.0	C	28.8	C
47	Acacia Ave/Base Line Rd	Signal	4.2	A	5.6	A
48	Acacia Ave/Foothill Blvd	Signal	12.7	B	12.6	B
49	Pepper Ave/Base Line Rd*	Signal	21.2	C	22.1	C
50	Pepper Ave/Foothill Blvd	Signal	23.3	C	23.2	C

* SANBAG CMP intersection

Notes:

HCM 2000 Operations Methodology.

LOS = Level of Service, Delay = Average Vehicle Delay (Seconds)

As shown in **Table 4**, the Alder Avenue/Base Line Road intersection is currently operating at LOS E in the a.m. peak hour. By state law, the traffic impact fee is only to address projected future deficiencies and is not intended to collect the full amount of improvements for existing intersection LOS deficiencies. New development would, however, continue to add trips to an already deficient intersection, worsening the traffic operating conditions. A discussion of how improvement costs are calculated for these currently deficient segments, based on the “fair share” portion of future trips only, is provided in Section 7.1.

The following study intersections are currently operating at LOS D:

- Sierra Avenue/Riverside Avenue;
- Ayala Drive/SR-210 Westbound Ramps;
- Cactus Avenue/Base Line Road;
- Riverside Ave/Easton Street;
- Riverside Avenue/Base Line Road;
- Riverside Avenue/Merrill Avenue; and
- Riverside Avenue/Valley Boulevard.

The study area also includes eighty seven (87) key roadway segments throughout the City and the City’s Sphere of Influence, developed in consultation with City staff. Existing Average Daily Traffic (ADT) volumes were collected at the 87 segments in May 2014. Consistent with the intersection volumes, existing roadway volumes provide a baseline to evaluate current performance of the circulation system and are used as the basis of future forecast volumes through the post-processing routine.

Since theoretical daily roadway segment capacities can vary between local jurisdictions, the values used in this analysis were developed by comparing capacities in several jurisdictions and using a rounded average value. The following capacities are used in this analysis for City of Rialto segments:

- 2-lane Undivided Roadway (2U) – 13,000 vehicles/day
- 2-lane Divided Roadway (2D) – 17,500 vehicles/day
- 4-lane Undivided Roadway (4U) – 25,500 vehicles/day
- 4-lane Divided Roadway (4D) – 35,000 vehicles/day
- 6-lane Divided Roadway (6D) – 56,000 vehicles/day

Using these theoretical capacities, the existing Volume-to-Capacity (V/C) ratios were evaluated in order to identify deficiencies in the roadway network. For purposes of this analysis, a segment was considered deficient having a V/C ratio of 1.00 or greater. **Table 5** summarizes the existing Volume-to-Capacity (V/C) ratios at the roadway segments.

TABLE 5: EXISTING CONDITIONS – ROADWAY SEGMENT LOS

Intersection		Location	V/C
1	Sierra Ave	Between Riverside Ave and I-15 NB Ramps	0.57
2	Riverside Ave	Between Alder Ave and Amberwood Ave	0.25
3	Riverside Ave	Between Alder Ave and Locust Ave	0.28
4	Riverside Ave	Between Ayala Dr and Peach St	0.38
5	Riverside Ave	East of Ayala Dr	0.40
6	Riverside Ave	Between Cactus Ave/Country Club and Casmalia St	0.56
7	Alder Ave	South of Riverside Ave	0.13
8	Ayala Dr	South of Riverside Ave	0.14
9	Cactus Ave	South of Riverside Ave	0.10
10	Alder Ave	North of Casmalia St/ Sierra Lakes Pkwy	0.16
11	Locust Ave	North of Casmalia St/ Sierra Lakes Pkwy	0.72
12	Ayala Dr	North of Casmalia St/ Sierra Lakes Pkwy	0.26
13	Casmalia St/ Sierra Lakes Pkwy	Between Alder Ave and Sierra Ave	0.29
14	Casmalia St/ Sierra Lakes Pkwy	Between Alder Ave and Locust Ave	0.70
15	Casmalia St/ Sierra Lakes Pkwy	Between Linden Ave and Cedar Ave	0.22
16	Casmalia St/ Sierra Lakes Pkwy	Between Ayala Dr and Spruce Ave	0.19
17	Easton St	Between Alder Ave and Palmetto Ave	0.10
18	Easton St / Renaissance Pkwy	Between Locust Ave and Linden Ave	0.10
19	Renaissance Pkwy	East of Ayala Dr	0.37
20	Easton St	Between Alice Ave and Riverside Ave	0.48
21	Easton St	Between Riverside Ave and Highland Ave	0.39
22	Alder Ave	Between Renaissance Pkwy and Base Line Rd	1.02
23	Locust Ave	South of Casmalia St/ Sierra Lakes Pkwy	0.10
24	Ayala Dr	Between Renaissance Pkwy and Base Line Rd	1.00
25	Cactus Ave	Between Renaissance Pkwy and Base Line Rd	0.28
26	Riverside Ave	Between Easton St and Base Line Rd	0.97
27	Pepper Ave	Between Base Line Rd and Mariposa Ave	0.14
28	Base Line Rd	Between Alder Ave and Tamarind Ave	0.69
29	Base Line Rd	Between Alder Ave and Laurel Ave	0.60
30	Base Line Rd	Between Linden Ave and Ayala Dr	0.40
31	Base Line Rd	West of Cactus Ave	0.44
32	Base Line Rd	Between Lilac Ave and Willow Ave	0.53
33	Base Line Rd	Between Sycamore Ave and Acacia Ave	0.56
34	Base Line Rd	East of Pepper Ave	0.44
35	Ayala Dr / Cedar Ave	Between Etiwanda Ave and Holly St	0.58
36	Cactus Ave	Between Etiwanda Ave and Valencia St	0.31
37	Riverside Ave	Between Etiwanda Ave and Valencia St	0.66
38	Pepper Ave	Between Etiwanda Ave and Valencia St	0.31

Intersection		Location	V/C
39	Foothill Blvd	Between Cedar Ave and Linden Ave	0.44
40	Foothill Blvd	Between Larch Ave and Spruce Ave	0.48
41	Foothill Blvd	Between Lilac Ave and Millard Ave	0.59
42	Foothill Blvd	Between Sycamore Ave and Acacia Ave	0.62
43	Foothill Blvd	East of Pepper Ave	0.63
44	Cedar Ave	South of Foothill Blvd	0.69
45	Cactus Ave	South of Foothill Blvd	0.48
46	Riverside Ave	South of Foothill Blvd	0.62
47	Pepper Ave	South of Foothill Blvd	0.74
48	Rialto Ave	Between Cedar Ave and Linden Ave	0.36
49	Rialto Ave	Between Larch Ave and Spruce Ave	0.29
50	Rialto Ave	Between Lilac Ave and Willow Ave	0.23
51	Cedar Ave	South of Rialto Ave	0.83
52	Cactus Ave	South of Rialto Ave	0.35
53	Riverside Ave	South of Rialto Ave	0.63
54	Merrill Ave	Between Linden Ave and Cedar Ave	0.45
55	Merrill Ave	Between Cedar Ave and Cactus Ave	0.41
56	Merrill Ave	Between Willow Ave and Riverside Ave	0.30
57	Merrill Ave	Between Riverside Ave and Sycamore Ave	0.37
58	Riverside Ave	South of Merrill Ave	0.67
59	Bloomington Ave	Between Merrill Ave and Willow Ave	0.16
60	Bloomington Ave	Between Cactus Ave and Lilac Ave	0.20
61	Bloomington Ave	Between Cactus Ave and San Bernardino Ave	0.28
62	Cactus Ave	North of Randall Ave	0.30
63	Cactus Ave	Between Bloomington Ave and Woodcrest St	0.21
64	Alder Ave	North of Valley Blvd	0.54
65	Cedar Ave	North of Bloomington Ave	0.85
66	Cactus Ave	North of Valley Blvd	0.42
67	Cactus Ave	North of Santa Ana Ave	0.08
68	Riverside Ave	North of Valley Blvd	0.74
69	Valley Blvd	Between Locust Ave and Linden Ave	0.57
70	Valley Blvd	Between Cedar Ave and Church St	0.52
71	Valley Blvd	Between Cactus Ave and Spruce Ave	0.40
72	Valley Blvd	Between Lilac Ave and Willow Ave	0.49
73	Valley Blvd	Between Riverside Ave and Sycamore Ave	0.34
74	Cedar Ave	Between Orange St and Slover Ave	0.85
75	Riverside Ave	Between Cameron Way and Slover Ave	0.98
76	Slover Ave	Between Locust Ave and Maple Ave	0.33
77	Slover Ave	Between Cactus Ave and Spruce Ave	0.19

Intersection		Location	V/C
78	Cedar Ave	Between Santa Ana Ave and Slover Ave	0.73
79	Santa Ana Ave	Between Cedar Ave and Linden Ave	0.38
80	Santa Ana Ave	Between Cedar Ave and Olive St	0.28
81	Alder Ave	Between Maywood St and Santa Ana Ave	0.16
82	Riverside Ave	North of Jurupa Ave	0.91
83	Jurupa Ave	Between Cedar Ave and Oak St	0.22
84	Jurupa Ave	Between Cedar Ave and Pepper St	0.29
85	Jurupa Ave	Between Riverside Ave and Willow Ave	0.11
86	Riverside Ave	Between Jurupa Ave and Resource Dr	0.90
87	Agua Mansa Rd	Between Riverside Ave and Enterprise Dr	0.43

Notes:

V/C = Volume-to-Capacity ratio

As shown in **Table 5**, the following roadway corridors are currently operating above their theoretical capacities, with a V/C ratio equal to or greater than 1.00:

- Alder Avenue just south of Easton Street/Renaissance Parkway; and
- Ayala Avenue just south of Easton Street/Renaissance Parkway.

Similar to the intersections, by State law, the traffic impact fee is only to address projected future deficiencies and is not intended to be collected to improve any existing roadway capacity deficiencies. New development would, however, continue to add trips to the already deficient segments, worsening the traffic operating conditions. A discussion of how improvement costs are calculated for these currently deficient segments, based on the “fair share” portion of future trips only, is provided in Section 7.2.

5.0 FUTURE YEAR 2040 CONDITIONS

This section presents the future year 2040 conditions LOS at the study intersections and roadways. As part of this scenario, the forecast future year 2040 traffic conditions were evaluated by analyzing 2040 volumes on the current intersection and roadway configurations in order to determine the deficiencies that are directly attributable to new development. Thus, no future circulation improvements have been assumed in the future year 2040 conditions LOS analysis. The future year 2040 traffic volumes were developed using the SBTAM, as described in Section 2.1. The future year 2040 conditions a.m. and p.m. peak hour intersection traffic volumes are provided in **Appendix B**.

Table 6 summarizes the future year 2040 LOS results at the study intersection. Detailed LOS calculation sheets are provided in **Appendix C**.

TABLE 6: FUTURE YEAR 2040 CONDITIONS - INTERSECTION LOS

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
1	Sierra Ave/I-15 NB Ramps	Stop-controlled	64.5	F	56.4	F
2	Sierra Ave/Riverside Ave	Stop-controlled	66.6	F	70.5	F
3	Live Oak Ave/Riverside Ave	Signal	19.7	B	9.1	A
4	Alder Ave/Riverside Ave	Signal	10.2	B	7.3	A
5	Alder Ave/Sierra Lakes Pkwy	Signal	19.3	B	21.5	C
6	Alder Ave/SR-210 WB Ramps	Signal	65.2	E	56.8	E
7	Alder Ave/SR-210 EB Ramps	Signal	59.6	E	33.6	C
8	Alder Ave/Renaissance Pkwy	Signal	71.4	E	43.6	D
9	Alder Ave/Base Line Rd	Signal	330.0	F	301.1	F
10	Locust Ave/Sierra Lakes Pkwy	Signal	16.5	B	23.3	C
11	Locust Ave/Base Line Rd	Stop-controlled	16.4	B	16.9	B
12	Ayala Dr/Riverside Ave*	Signal	13.0	B	15.0	B
13	Ayala Dr/Casmalia St	Signal	17.7	B	7.7	A
14	Ayala Dr/SR-210 WB Ramps	Signal	79.1	E	23.0	C
15	Ayala Dr/SR-210 EB Ramps	Signal	18.2	B	19.7	B
16	Ayala Dr/Renaissance Pkwy	Signal	47.0	D	83.9	F
17	Cedar Ave/Base Line Rd*	Signal	112.5	F	70.5	E
18	Cedar Ave/Foothill Blvd	Signal	49.8	D	62.1	E
19	Cedar Ave/Rialto Ave*	Signal	59.1	E	34.3	C
20	Cedar Ave/Merrill Ave	Signal	29.9	C	30.9	C
21	Cedar Ave/Randall Ave	Signal	11.5	B	14.4	B
22	Cactus Ave/Riverside Ave*	Signal	24.0	C	11.2	B
23	Cactus Ave/Casmalia St	Signal	26.4	D	9.8	A
24	Cactus Ave/Easton St	Stop-controlled	46.3	E	17.9	C
25	Cactus Ave/Base Line Rd*	Signal	123.0	F	54.5	D
26	Cactus Ave/Foothill Blvd	Signal	39.7	D	43.2	D
27	Cactus Ave/Rialto Ave	Signal	41.6	D	8.9	A
28	Cactus Ave/Merrill Ave	Signal	19.2	B	16.5	B
29	Cactus Ave/Randall Ave	Signal	11.8	B	9.4	A
30	Cactus Ave/San Bernardino Ave	Signal	60.5	F	51.7	F
31	Cactus Ave/Valley Blvd	Signal	46.7	D	15.8	B
32	Riverside Ave/SR-210 WB Ramps	Signal	24.7	C	20.8	C
33	Riverside Ave/SR-210 EB Ramps	Signal	16.8	B	17.6	B
34	Riverside Ave/Easton St	Signal	58.3	E	34.5	C
35	Riverside Ave/Base Line Rd*	Signal	55.7	E	47.5	D
36	Riverside Ave/Foothill Blvd	Signal	40.1	D	43.8	D

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
37	Riverside Ave/Rialto Ave*	Signal	30.3	C	32.8	C
38	Riverside Ave/Merrill Ave/Bloomington Ave*	Signal	41.4	D	54.7	D
39	Riverside Ave/Randall Ave	Signal	30.3	C	23.4	C
40	Riverside Ave/San Bernardino Ave*	Signal	57.3	E	74.2	E
41	Riverside Ave/Valley Blvd*	Signal	188.8	F	50.9	D
42	Riverside Ave/I-10 WB Ramps	Signal	31.6	C	22.8	C
43	Riverside Ave/I-10 EB Ramps	Signal	80.2	F	129.7	F
44	Riverside Ave/Slover Ave*	Signal	183.3	F	118.7	F
45	Riverside Ave/Jurupa Ave*	Signal	63.8	E	13.4	B
46	Riverside Ave/Agua Mansa Rd*	Signal	167.6	F	229.4	F
47	Acacia Ave/Base Line Rd	Signal	7.4	A	8.2	A
48	Acacia Ave/Foothill Blvd	Signal	20.3	C	17.3	B
49	Pepper Ave/Base Line Rd*	Signal	34.9	C	45.6	D
50	Pepper Ave/Foothill Blvd	Signal	43.1	D	45.5	D

* SANBAG CMP intersection

Notes:

HCM 2000 Operations Methodology.

LOS = Level of Service, Delay = Average Vehicle Delay (Seconds)

As shown in **Table 6**, the following study intersections are forecast to operate at LOS E or worse in future year 2040:

- Sierra Avenue/I-15 Northbound Ramps;
- Sierra Avenue/Riverside Avenue;
- Alder Avenue/SR-210 Westbound Ramps;
- Alder Avenue/SR-210 Eastbound Ramps;
- Alder Avenue/Renaissance Parkway;
- Alder Avenue/Base Line Road;
- Ayala Drive/I-210 Westbound Ramps;
- Ayala Drive/Renaissance Parkway;
- Cedar Avenue/Base Line Road;
- Cedar Avenue/Foothill Boulevard;
- Cedar Avenue/Rialto Avenue;
- Cactus Avenue/Base Line Road;
- Cactus Avenue/San Bernardino Avenue;
- Riverside Ave/Easton Street;
- Riverside Avenue/Base Line Road;
- Riverside Avenue/San Bernardino Avenue;
- Riverside Avenue/Valley Boulevard;
- Riverside Avenue/I-10 Eastbound Ramps;
- Riverside Avenue/Slover Avenue;

- Riverside Avenue/Jurupa Avenue; and
- Riverside Avenue/Agua Mansa Road.

Using the same theoretical roadway capacities used for existing conditions, the future year 2040 V/C ratios were evaluated in order to identify future deficiencies in the roadway network. **Table 7** summarizes the future year 2040 V/C ratios at the roadway segments.

TABLE 7: FUTURE YEAR 2040 CONDITIONS – ROADWAY SEGMENT LOS

Intersection		Location	V/C
1	Sierra Ave	Between Riverside Ave and I-15 NB Ramps	1.18
2	Riverside Ave	Between Alder Ave and Amberwood Ave	0.68
3	Riverside Ave	Between Alder Ave and Locust Ave	0.61
4	Riverside Ave	Between Ayala Dr and Peach St	0.57
5	Riverside Ave	East of Ayala Dr	0.65
6	Riverside Ave	Between Cactus Ave/Country Club and Casmalia St	0.82
7	Alder Ave	South of Riverside Ave	0.26
8	Ayala Dr	South of Riverside Ave	0.25
9	Cactus Ave	South of Riverside Ave	0.16
10	Alder Ave	North of Casmalia St/ Sierra Lakes Pkwy	0.31
11	Locust Ave	North of Casmalia St/ Sierra Lakes Pkwy	0.95
12	Ayala Dr	North of Casmalia St/ Sierra Lakes Pkwy	0.40
13	Casmalia St/ Sierra Lakes Pkwy	Between Alder Ave and Sierra Ave	0.31
14	Casmalia St/ Sierra Lakes Pkwy	Between Alder Ave and Locust Ave	0.79
15	Casmalia St/ Sierra Lakes Pkwy	Between Linden Ave and Cedar Ave	0.33
16	Casmalia St/ Sierra Lakes Pkwy	Between Ayala Dr and Spruce Ave	0.25
17	Easton St	Between Alder Ave and Palmetto Ave	0.25
18	Easton St / Renaissance Pkwy	Between Locust Ave and Linden Ave	0.29
19	Renaissance Pkwy	East of Ayala Dr	0.54
20	Easton St	Between Alice Ave and Riverside Ave	0.54
21	Easton St	Between Riverside Ave and Highland Ave	0.42
22	Alder Ave	Between Renaissance Pkwy and Base Line Rd	1.32
23	Locust Ave	South of Casmalia St/ Sierra Lakes Pkwy	0.25
24	Ayala Dr	Between Renaissance Pkwy and Base Line Rd	1.08
25	Cactus Ave	Between Renaissance Pkwy and Base Line Rd	0.39
26	Riverside Ave	Between Easton St and Base Line Rd	0.89
27	Pepper Ave	Between Base Line Rd and Mariposa Ave	1.52
28	Base Line Rd	Between Tamarind Ave and Alder Ave	1.78
29	Base Line Rd	Between Alder Ave and Laurel Ave	1.05
30	Base Line Rd	Between Linden Ave and Ayala Dr	0.88
31	Base Line Rd	West of Cactus Ave	0.74

Intersection		Location	V/C
32	Base Line Rd	Between Lilac Ave and Willow Ave	0.73
33	Base Line Rd	Between Sycamore Ave and Acacia Ave	0.71
34	Base Line Rd	East of Pepper Ave	0.48
35	Ayala Dr / Cedar Ave	Between Etiwanda Ave and Holly St	0.74
36	Cactus Ave	Between Etiwanda Ave and Valencia St	0.60
37	Riverside Ave	Between Etiwanda Ave and Valencia St	0.72
38	Pepper Ave	Between Etiwanda Ave and Valencia St	0.59
39	Foothill Blvd	Between Cedar Ave and Linden Ave	0.61
40	Foothill Blvd	Between Larch Ave and Spruce Ave	0.66
41	Foothill Blvd	Between Lilac Ave and Millard Ave	0.74
42	Foothill Blvd	Between Sycamore Ave and Acacia Ave	0.80
43	Foothill Blvd	East of Pepper Ave	0.79
44	Cedar Ave	South of Foothill Blvd	0.85
45	Cactus Ave	South of Foothill Blvd	0.88
46	Riverside Ave	South of Foothill Blvd	0.76
47	Pepper Ave	South of Foothill Blvd	1.04
48	Rialto Ave	Between Cedar Ave and Linden Ave	0.34
49	Rialto Ave	Between Larch Ave and Spruce Ave	0.35
50	Rialto Ave	Between Lilac Ave and Willow Ave	0.28
51	Cedar Ave	South of Rialto Ave	1.05
52	Cactus Ave	South of Rialto Ave	0.60
53	Riverside Ave	South of Rialto Ave	0.77
54	Merrill Ave	Between Linden Ave and Cedar Ave	0.40
55	Merrill Ave	Between Cedar Ave and Cactus Ave	0.48
56	Merrill Ave	Between Willow Ave and Riverside Ave	0.34
57	Merrill Ave	Between Riverside Ave and Sycamore Ave	0.47
58	Riverside Ave	South of Merrill Ave	0.75
59	Bloomington Ave	Between Merrill Ave and Willow Ave	0.35
60	Bloomington Ave	Between Cactus Ave and Lilac Ave	0.41
61	Bloomington Ave	Between Cactus Ave and San Bernardino Ave	0.55
62	Cactus Ave	North of Randall Ave	0.55
63	Cactus Ave	Between Bloomington Ave and Woodcrest St	0.40
64	Alder Ave	North of Valley Blvd	1.38
65	Cedar Ave	North of Bloomington Ave	0.87
66	Cactus Ave	North of Valley Blvd	0.65
67	Cactus Ave	North of Santa Ana Ave	0.11
68	Riverside Ave	North of Valley Blvd	0.85
69	Valley Blvd	Between Locust Ave and Linden Ave	0.50
70	Valley Blvd	Between Cedar Ave and Church St	0.61

Intersection		Location	V/C
71	Valley Blvd	Between Cactus Ave and Spruce Ave	0.49
72	Valley Blvd	Between Lilac Ave and Willow Ave	0.64
73	Valley Blvd	Between Riverside Ave and Sycamore Ave	0.44
74	Cedar Ave	Between Orange St and Slover Ave	1.02
75	Riverside Ave	Between Cameron Way and Slover Ave	1.40
76	Slover Ave	Between Locust Ave and Maple Ave	0.62
77	Slover Ave	Between Cactus Ave and Spruce Ave	0.25
78	Cedar Ave	Between Santa Ana Ave and Slover Ave	0.93
79	Santa Ana Ave	Between Cedar Ave and Linden Ave	0.51
80	Santa Ana Ave	Between Cedar Ave and Olive St	0.37
81	Alder Ave	Between Maywood St and Santa Ana Ave	1.09
82	Riverside Ave	North of Jurupa Ave	1.39
83	Jurupa Ave	Between Cedar Ave and Oak St	0.28
84	Jurupa Ave	Between Cedar Ave and Pepper St	0.33
85	Jurupa Ave	Between Riverside Ave and Willow Ave	0.15
86	Riverside Ave	Between Jurupa Ave and Resource Dr	1.38
87	Agua Mansa Rd	Between Riverside Ave and Enterprise Dr	0.66

Notes:

V/C = Volume-to-Capacity ratio

As shown in **Table 7**, the following roadway corridors are currently operating above their theoretical capacities, with a V/C ratio equal to or greater than 1.00:

- Sierra Avenue between Riverside Avenue and I-15 Northbound Ramps;
- Alder Avenue just south of Easton Street/Renaissance Parkway;
- Ayala Avenue just south of Easton Street/Renaissance Parkway;
- Alder Avenue between Base Line Road and Mariposa Avenue;
- Base Line Road between Tamarind Avenue and Alder Avenue;
- Base Line Road between Alder Avenue and Laurel Avenue;
- Pepper Avenue south of Foothill Boulevard;
- Cedar Avenue south of Rialto Avenue;
- Alder Avenue north of Valley Boulevard;
- Cedar Avenue between Orange Street and Slover Avenue;
- Riverside Avenue between Cameron Way and Slover Avenue;
- Alder Avenue between Maywood Street and Santa Ana Avenue;
- Riverside Avenue north of Jurupa Avenue; and
- Riverside Avenue between Jurupa Avenue and Resource Drive.

6.0 TRAFFIC IMPACT FEE PROJECT LIST

The objective of the traffic impact fee is to fund traffic improvements that are needed as a result of new development within the City. The intersection and corridor improvements range from items such as smaller re-striping of intersection approaches to modifying the lane usage and modifications to traffic signals to more significant street widening and new traffic signal construction and installations. Iteris worked closely with City staff in identifying the need and consistency with the circulation network, analyzing the results, and verifying the needed improvements. The final list of improvements was reviewed and approved by City staff. **Figure 2** shows the locations of the intersections and roadway segments for which improvements are recommended in the impact program.

Table 8 summarizes the list of intersection improvements that are recommended as part of this impact fee program.

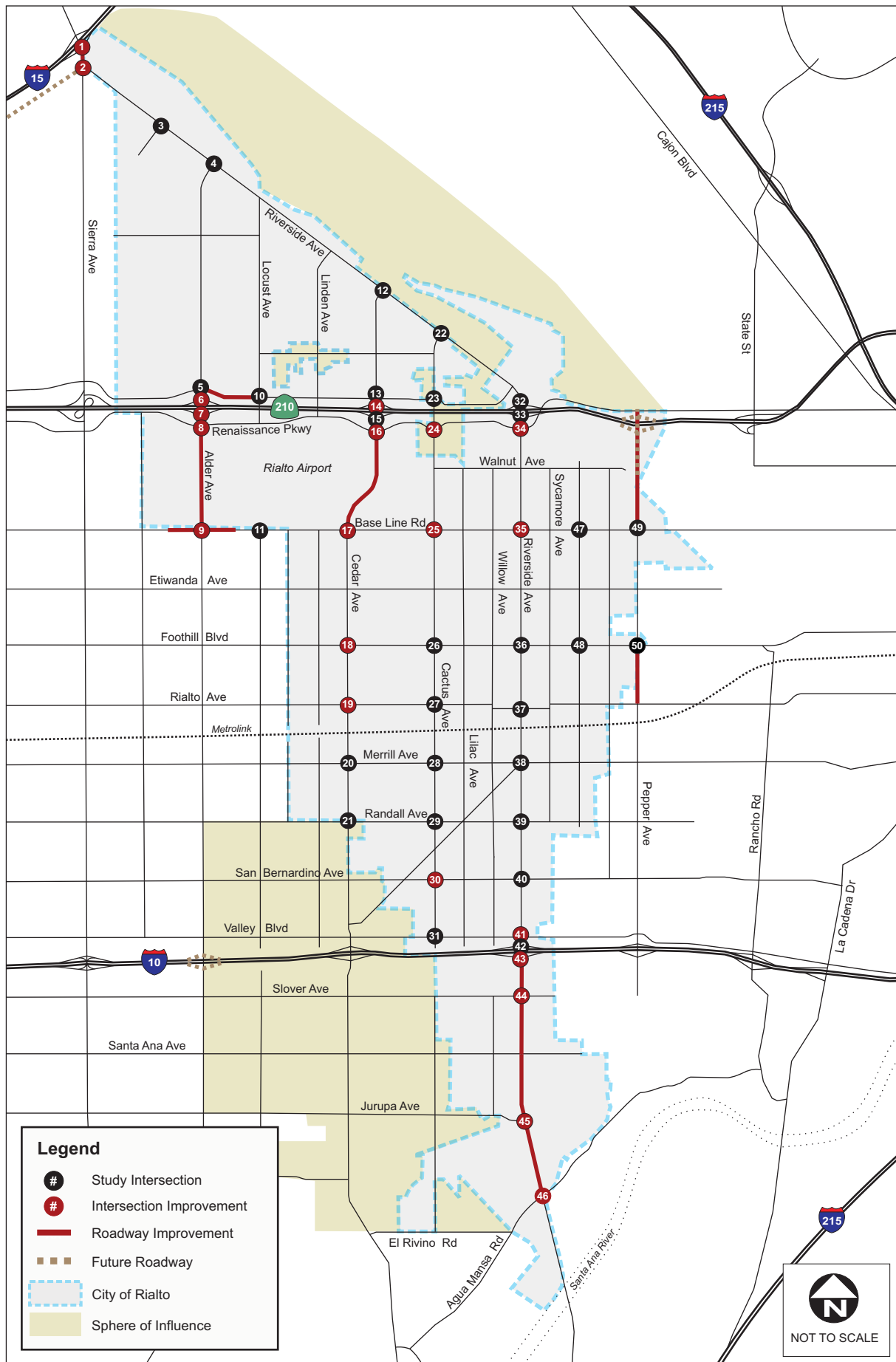


TABLE 8: INTERSECTION IMPROVEMENT PROJECT LIST

Intersection		Improvement
1	Sierra Ave/I-15 NB Ramps	Install a traffic signal and some civil improvements. No civil improvements in City of Fontana ROW
2	Sierra Ave/Riverside Ave	Install a traffic signal. Add a dedicated WB right-turn lane.
6	Alder Ave/SR-210 WB Ramps	Add a 2nd NB left-turn lane by re-striping the #1 through lane. Add 3rd lane on WB on-ramp (1 lane must be HOV)
7	Alder Ave/SR-210 EB Ramps	Addition of dedicated NB right-turn lane
8	Alder Ave/Renaissance Pkwy	Add a 2nd SB left-turn lane and Re-stripe the SB right-turn lane to a shared through/right-turn lane.
9	Alder Ave/Base Line Rd*	Add a 2nd EB through lane with a dedicated right-turn lane. Add a 2nd WB through lane with a dedicated right-turn lane.
14	Ayala Ave/SR-210 WB Ramps	Widen the SB approach to add a dedicated right-turn lane
16	Ayala Ave/Renaissance Pkwy/Easton	Add a 2nd EB left-turn lane.
17	Ayala Ave/Base Line Rd	Re-stripe the NB right-turn lane to a shared through/right-turn lane. Add a 2nd EB left-turn lane
18	Cedar Ave/Foothill Blvd	Add a 2nd NB left-turn lane. Add a 2nd SB left-turn lane.
19	Cedar Ave/Rialto Ave	Add a dedicated NB right-turn lane.
24	Cactus Ave/Easton	Install a traffic signal. A precise HCM-based LOS is not available due to number of lanes.
25	Cactus Ave/Base Line Rd	Add a 2nd NB left-turn lane. Add a dedicated NB right-turn lane. Add a 2nd EB left-turn lane. Add a 2nd WB left-turn lane. Add a dedicated WB right-turn lane.
30	Cactus Ave/San Bernardino Ave	Install a traffic signal. A precise HCM-based LOS is not available due to number of lanes.
34	Riverside Ave/Easton	Modify traffic signal to include a WB right-turn overlap phase.
35	Riverside Ave/Base Line Rd	Add a dedicated EB right-turn lane
41	Riverside Ave/Valley Blvd	Add a 2nd WB left-turn lane. Restripe the number two EB through lane to a shared through/right- turn lane

Intersection		Improvement
43	Riverside Ave/I-10 EB Ramps	Add a dedicated NB right-turn lane. Add a 3rd SB through lane.
44	Riverside Ave/Slover Ave	Add a 3rd NB through lane and a 3rd SB through lane
45	Riverside Ave/Jurupa Ave	Add a 3rd SB through lane
46	Riverside Ave/Agua Mansa Rd	Add a 3rd SB through lane. Add a 2nd EB through lane and a 2nd WB through lane by re-striping the dedicated right-turn lanes into shared through/right-turn lanes. Add a 2nd EB left-turn lane and a 2nd WB left-turn lane.

* Intersection identified as having an existing deficiency, thus the cost applied to the fee will reflect a "fair share" percentage of the total improvement cost.

Table 9 summarizes the list of required roadway improvements.

TABLE 9: ROADWAY SEGMENT IMPROVEMENT PROJECT LIST

Roadway Segment	Improvement
Casmalia St between Alder and Locust	Widen from 2 lane undivided to 4 lane divided
Pepper Ave between Foothill Blvd and Rialto Ave	Widen from 2 lane undivided to 4 lane divided
Base Line Rd between Tamarind Ave and Laurel Ave	Widen from 2-3 lane divided roadway to 4 lane divided
Riverside Ave between I-10 EB Ramps and Agua Mansa Rd	Widen from 4-5 lane roadway to 6 lane roadway.
Pepper Ave between Base Line Rd and Highland Ave	Widen from 2 lane undivided roadway to 4 lane divided roadway.
Sierra Ave between I-15 NB Ramps and Riverside Ave*	Widen from 4-lane divided to 6-lane divided
Alder Ave between Renaissance Pkwy and Base Line Rd*	Widen from 2 lane undivided to 4 lane divided
Ayala Ave between Renaissance Pkwy and Base Line Rd*	Widen from 3 lane undivided to 4 lane divided

* Segment identified as having an existing deficiency, thus the cost applied to the fee will reflect a "fair share" percentage of the total improvement cost.

As mentioned, improvements identified in this traffic impact fee study were developed in consultation with City staff. All improvement recommendations were developed as a result of traffic impacts caused by or worsened by new development. However, improvements were not recommended at all the impacted locations, for various reasons. Some potential recommendations were determined to not be feasible, while others were not considered to be consistent with the surrounding circulation network. While the traffic analysis has defined a list of deficiencies based on nexus requirements, the City has option to include less than what is actually required in the fee program.

7.0 PROJECT COST ESTIMATES

This section describes the methodology used to estimate the total cost of the intersection and roadway improvement projects described in Section 6. The improvement costs were reviewed and approved by City staff. It should be noted that the cost estimates are intended to be “planning level” estimates consistent with the intent of estimated long-range improvement costs, including appropriate levels of contingency and soft costs, which are calculated prior to availability of design details or documents related to these improvements.

7.1 INTERSECTION IMPROVEMENT COST ESTIMATES

The total intersection improvement costs are summarized in **Table 10**. These costs included construction, design, and right-of-way (if necessary). A detailed breakdown illustrating the details of the cost elements at each intersection is provided in **Appendix D**.

TABLE 10: INTERSECTION IMPROVEMENT PROJECT COSTS

	Intersection	Initial Cost Estimate	Reduction due to SANBAG funding (60% reimbursed)	Final Cost Estimate
1	Sierra Ave/I-15 NB Ramps	\$440,400	\$0	\$440,400
2	Sierra Ave/Riverside Ave	\$532,800	\$0	\$532,800
6	Alder Ave/SR-210 WB Ramps	\$127,800	\$0	\$127,800
7	Alder Ave/SR-210 EB Ramps	\$300,000	\$0	\$300,000
8	Alder Ave/Renaissance Pkwy	\$337,200	\$0	\$337,200
9	Alder Ave/Base Line Rd*	\$293,263	\$0	\$293,263
14	Ayala Ave/SR-210 WB Ramps	\$169,200	\$0	\$169,200
16	Ayala Ave/Renaissance Pkwy	\$236,400	\$0	\$236,400
17	Ayala Ave/Base Line Rd	\$270,000	\$0	\$270,000
18	Cedar Ave/Foothill Blvd	\$669,600	\$0	\$669,600
19	Cedar Ave/Rialto Ave	\$162,000	\$0	\$162,000
24	Cactus Ave/Easton St	\$360,000	\$0	\$360,000
25	Cactus Ave/Base Line Rd	\$1,376,400	\$0	\$1,376,400
30	Cactus Ave/San Bernardino Ave	\$370,800	\$0	\$370,800
34	Riverside Ave/Easton St	\$14,400	\$0	\$14,400
35	Riverside Ave/Base Line Rd	\$300,000	\$0	\$300,000
41	Riverside Ave/Valley Blvd	\$561,600	\$0	\$561,600
43	Riverside Ave/I-10 EB Ramps	\$20,191,700	\$0	\$20,191,700
44	Riverside Ave/Slover Ave	\$355,200	\$0	\$355,200
45	Riverside Ave/Jurupa Ave	\$122,400	\$0	\$122,400

Intersection		Initial Cost Estimate	Reduction due to SANBAG funding (60% reimbursed)	Final Cost Estimate
46	Riverside Ave/Agua Mansa Rd	\$616,800	-\$410,200	\$206,600
Total		\$27,807,963	-\$410,200	\$27,397,763

* Intersection identified as having an existing deficiency, thus the cost applied to the fee (as shown) reflects a “fair share” percentage of the total improvement cost.

As shown in **Table 10**, the total cost of intersection improvements is estimated to be \$27,397,763.

As mentioned in Section 4, the Alder Avenue/Base Line Road intersection is currently operating deficiently. The traffic impact fee is not intended to fully collect funds to improve existing deficiencies. At this intersection, only a portion of the overall improvement costs were applied towards the fee calculation, reflecting the portion that would be due to future growth. This portion, also known as a fair share percentage, was calculated by dividing the net new trips expected to be generated by new development by the total future trips at each intersection. The fair share calculations are provided in **Appendix E**.

7.2 CORRIDOR IMPROVEMENT COST ESTIMATES

The total corridor improvement costs are summarized in **Table 11**. These costs included construction, design, and right-of-way (if necessary). A detailed breakdown illustrating the details of the cost elements at each segment is provided in **Appendix D**.

TABLE 11: ROADWAY SEGMENT IMPROVEMENT PROJECT COSTS

Roadway Segment	Initial Cost Estimate	Reduction due to SANBAG funding (60% reimbursed)	Final Cost Estimate
Casmalia St between Alder and Locust	\$2,745,000	-\$1,207,200	\$1,537,800
Pepper Ave between Foothill Blvd and Rialto Ave	\$5,657,325	\$0	\$5,657,325
Base Line Rd between Tamarind Ave and Laurel Ave	\$6,103,080	-\$900,000	\$5,203,080
Riverside Ave between I-10 EB Ramps and Agua Mansa Rd	\$40,429,920	-\$15,000,000 ¹	\$25,429,920
Pepper Ave between Base Line Rd and Highland Ave	\$2,029,400	\$0	\$2,029,400
Sierra Ave between I-15 NB Ramps and Riverside Ave	\$996,950	\$0	\$996,950
Alder Ave between Renaissance Pkwy and Base Line Rd	\$2,409,075*	\$0	\$2,409,075*
Ayala Ave between Renaissance Pkwy and Base Line Rd	\$630,355*	\$0	\$630,355*
Total			\$43,893,905

* Segment identified as having an existing deficiency, thus the cost applied to the fee (as shown) reflects a “fair share” percentage of the total improvement cost.

¹ = Cost of overpass widening removed from impact fee costs. To be paid by other sources.

Table 12 summarizes the final cost calculations, considering both the intersection and segment improvement costs.

TABLE 12: TOTAL TRANSPORTATION IMPROVEMENT COSTS

Category	Cost
Intersection Improvements (including Design costs)	\$27,397,763
Corridor Improvements (including Design costs)	\$43,893,905
City Administration Fee ¹	\$1,425,833.37
5-year Fee Updates ²	\$30,000
TOTAL	\$72,747,502

1 = 2% of total improvement costs.

2 = Assumes a total of 3 impact fee updates (every 5 years) at a cost of \$10,000 per update

The total transportation improvement costs include estimates for administration and five-year updates of the fees:

- City Administration Fee – This fee covers annual tasks related to City Council action for Engineering News Record (ENR) construction cost increases, improvement project prioritization and budgeting, and public education. A fee of 2% of the total cost of improvements is assumed.
- 5-year Fee Update – This fee includes staff and consultant time to validate new construction, update land use data for zoning and General Plan changes, rerun the model, prepare reports, and prepare Council action if necessary. The 5-year Update would occur three times during the 15-year period. Each update would cost \$10,000, totaling \$30,000 over a 20-year period.

8.0 TRAFFIC IMPACT FEE CALCULATION

The Traffic Impact Fee was calculated by dividing the total costs of the intersection and roadway improvements, as calculated, by the expected net daily trips forecast to be generated from new development within the City by buildout of the General Plan land. The final maximum traffic impact fee, assuming the net transportation improvement cost of \$72,747,502 required as a result of the 201,369 new daily trips forecast in the buildout scenario (upon removing trips generated by exempt land uses), is \$361.27 per daily trip. This calculation assumes that all “trips” are expected to equally contribute to the need for the intersection improvements, regardless of the land use types that generate the trips. The fees to be collected as a result of this updated traffic impact fee nexus study are supplementary to the specific fees and conditional upon individual development projects by the City. All requirements of the Mitigation Fee Act in California Government Code Section 66001 have been met by this nexus study. The traffic impact fee would be collected at the time of building permit issuance.

8.1 FEE SCHEDULE

Using the traffic impact fee per daily trip, maximum fees for specific land uses were derived. Fees are calculated for the five major land use categories using daily trip generation rates contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (9th Edition). **Table 13** summarizes the maximum traffic impact fee per dwelling unit (residential) or square foot (non-residential) for the major land use categories in the City.

TABLE 13: TRAFFIC IMPACT FEE SCHEDULE PER LAND USE CATEGORIES

Land Use	Daily Trip Rate ¹	Maximum Traffic Impact Fee per Daily Trip	Maximum Traffic Impact Fee
Single-Family Residential	9.57 trips per dwelling unit	\$361.27	\$3,457/du
Multi-Family Residential	6.65 trip per dwelling unit	\$361.27	\$2,402/du
Retail	0.02925 trips per square foot ²	\$361.27	\$10.57/sf
Office	0.01100 trips per square foot	\$361.27	\$3.97/sf
Industrial	0.00697 trips per square foot	\$361.27	\$2.52/sf

1 = Institute of Transportation Engineers (ITE) Trip Generation, 9th Edition

2 = Daily trip rate reduced to account for removal of 34% typical pass-by trips

The impact fees shown in **Table 13** are the maximum traffic impact fees that can be legally administered by the City, in order to fund the improvements identified in this fee study. The City Council could opt to set the fees lower than these levels, but could not set the fees higher than these levels.

8.2 COST INCREASES OVER TIME

The cost estimates used to calculate the traffic impact fee were based on 2015 dollars and unit costs applied recently in other cities. In order for the traffic impact fee to stay current with changing construction and land costs, the City of Rialto has the authority to apply an inflation adjustment to the fee. Construction costs may be revised periodically to reflect changes in the Construction Cost Index published by the ENR.

9.0 COMPARISON WITH OTHER JURISDICTIONS

The traffic impact fees in similar jurisdictions within San Bernardino County, for the major land use categories, were reviewed in order to provide a comparison to the proposed City of Rialto traffic impact fees. **Table 14** summarizes the fees in other jurisdictions, where available.

TABLE 14: TRAFFIC IMPACT FEE COMPARISON

Jurisdiction	Traffic Impact Fee Per Development Type				
	Single-Family Residential (per du)	Multi-Family Residential (per du)	Retail/Commercial (per sq ft)	Office (per sq ft)	Industrial (per sq ft)
<i>Rialto (proposed max)</i>	\$3,457	\$2,402	\$10.57	\$3.97	\$2.52
Fontana	\$5,734	\$3,509	\$8.61	\$6.96	\$3.51
Rancho Cucamonga	\$9,002	\$5,401	\$13.50	\$10.80	\$5.40
SB County (Rialto Sphere)	\$7,895	\$5,486	\$17.02	\$10.90	\$6.01

As shown in **Table 14**, fees vary between jurisdictions. The proposed maximum City of Rialto fees are generally lower than fees imposed in Fontana and Rancho Cucamonga. Fees within the unincorporated San Bernardino County area adjacent to the City of Rialto (i.e. Rialto Sphere) are considerably higher than the proposed maximum Rialto fees.

10.0 MITIGATION FEE ACT FINDINGS

Development impact fees were enacted under Assembly Bill 1600 by the California Legislature in 1987 and codified under California Government Code Section 66000 et seq., also referred to as the Mitigation Fee Act (the “Act” or “AB 1600”), and are one authorized method of financing the public facilities necessary to mitigate the effects of new development. The Act requires that all public agencies satisfy the following requirements when establishing, increasing, or imposing a fee as a condition of new development:

A. Identify the Purpose of the Fee (Government Code Section 66001(A)(1))

The purpose of the impact fee is to finance the public transportation improvements needed to mitigate the traffic impacts of future development. These improvements and traffic impacts of future development are quantified in a Transportation/Traffic Impact Fee Nexus Study prepared by Iteris.

Based on the traffic model prepared by Iteris in connection with the Transportation/Traffic Impact Fee Nexus Study, the average daily number of trips within the City is forecast to increase

by 201,369 by 2040 (i.e., from 323,311 daily trips in 2012 to 524,680 daily trips in 2040). This figure (201,369) represents approximately 62% growth in daily trips over a 28-year time period. This growth in daily trips will create a demand for additional transportation improvements and facilities that existing facilities cannot accommodate. In order to accommodate new development in an orderly manner, while maintaining the current level of service in the City, the transportation improvements on the Project List will need to be constructed.

It is projected that the direct and cumulative effect of future development has required the preparation of this Transportation/Traffic Impact Fee Nexus Study. Each new development either creates a direct impact on the City's transportation system and/or contributes to the cumulative impact on the transportation system over time. Generally, without future development, the improvements on the Project List would not be necessary, as the existing facilities are adequate for the City's present population.

B. Identify the Use to which the Fee is to be Put (Government Code Section 66001(A)(2))

The impact fee will be used for and provide a source of revenue to the City for the design, acquisition, installation, and construction of the roadway, intersection, corridor, and other improvements identified on the Project List to mitigate the direct and cumulative impact of new development. These Improvements will in turn preserve the quality of life in the City and protect the health, safety, and welfare of future residents and employees.

C. Determine that there is a Reasonable Relationship between the Fee's Use and the Type of Development Project upon which the Fee is Imposed ("Benefit Relationship") (Government Code Section 66001(A)(3))

As discussed in Section A above, the projected direct and cumulative effects of future development have prompted the City to update its impact fee program. Each new development (including both "in fill" and "greenfield" projects) will contribute to the need for new transportation improvements. Generally, without future development, the City would have no need to acquire, construct, and/or install additional transportation facilities on the Project List. Even "in fill" development projects located adjacent to existing facilities will utilize and benefit from public facilities on the Project List. However, as part of the proposed impact fee, new development will be charged a "fair share" of the costs of certain improvements that are needed to accommodate the needs of existing as well as future development. The fair-share percentage is calculated by taking the ratio of trips for future development to the total trips for the facility in question (i.e., at an intersection or for a roadway segment with peak hour trips used for intersections and average daily trips (ADT) used for roadway segments) and multiplying it by the total improvement cost. There are three roadway segments and one intersection that fit the criteria of applying fair-share costs.

As set forth in this Transportation/Traffic Impact Fee Nexus Study, the development impact fees will be expended for the design, acquisition, installation, and construction of the transportation improvements identified on the Project List, as that is the purpose for which the development impact fees are collected. As previously stated, all new development creates either a direct

impact on or contributes to the cumulative impact of new development on the City's transportation system.

For the foregoing reasons, there is a reasonable relationship between the design, acquisition, construction, and installation of the transportation facilities on the Project List and new development as required under Section 66001(a)(3) of the Mitigation Fee Act.

D. Determine that there is a Reasonable Relationship between the Need for the Public Facility and the Type of Development Project upon which the Fee is Imposed ("Impact Relationship") (Government Code Section 66001(A)(4))

As previously stated, all new development within the City, irrespective of location, contributes to the direct and cumulative impact of development on the City's transportation system and creates a need for new transportation infrastructure to accommodate growth. With the exception noted above, the improvements identified on the Project List would not be necessary without future development. These improvements are needed to mitigate the effects of new development and maintain an adequate level of service for the community.

For the reasons presented herein, there is a reasonable relationship between the need for the transportation facilities included on the Project List and all new development within the City as required under Section 66001(a)(4) of the Mitigation Fee Act.

E. Discuss how there is a Reasonable Relationship between the Amount of the Fee and the Cost of the Public Facilities Attributable to the Development upon which the Fee is Imposed ("Rough Proportionality Relationship") (Government Code 66001(A))

As set forth above, all new development in the City impacts the transportation system. Moreover, each individual development project and its related increase in population and employment and corresponding increase in traffic, along with the cumulative impacts of all development in the City, will adversely impact, directly and cumulatively, existing facilities.

The method utilized in calculating impact fees for different types of development, which employs Institute of Transportation Engineers (ITE) trip rates, results in a reasonable proportionality relationship between the amount of the fee and the facility cost attributable to the new development project on which the fee is imposed. More specifically, the maximum traffic impact fee per daily trip, generated by the traffic model prepared by Iteris, is applied to five major land use categories (Single-Family Residential, Multi-Family Residential, Retail, Office, and Industrial) to determine a maximum fee per dwelling unit or building square foot. Note that for Retail, the trip rate is reduced to account for pass-by trips (i.e., roughly 34% of Retail trips as estimated by the ITE).

Thus, the proposed fee amounts are roughly proportional to the impact resulting from new development, and there is a reasonable relationship between the amount of the fee and the portion of cost of the facilities attributable to new development.

Submitted by:



CITY OF RIALTO
TRANSPORTATION/TRAFFIC IMPACT FEE
Nexus Study
Technical Appendix

Submitted to:
City of Rialto

17J14-1737

APPENDIX A: MITIGATION FEE ACT

GOVERNMENT CODE

SECTION 66000-66008

66000. As used in this chapter, the following terms have the following meanings:

(a) "Development project" means any project undertaken for the purpose of development. "Development project" includes a project involving the issuance of a permit for construction or reconstruction, but not a permit to operate.

(b) "Fee" means a monetary exaction other than a tax or special assessment, whether established for a broad class of projects by legislation of general applicability or imposed on a specific project on an ad hoc basis, that is charged by a local agency to the applicant in connection with approval of a development project for the purpose of defraying all or a portion of the cost of public facilities related to the development project, but does not include fees specified in Section 66477, fees for processing applications for governmental regulatory actions or approvals, fees collected under development agreements adopted pursuant to Article 2.5 (commencing with Section 65864) of Chapter 4, or fees collected pursuant to agreements with redevelopment agencies that provide for the redevelopment of property in furtherance or for the benefit of a redevelopment project for which a redevelopment plan has been adopted pursuant to the Community Redevelopment Law (Part 1 (commencing with Section 33000) of Division 24 of the Health and Safety Code).

(c) "Local agency" means a county, city, whether general law or chartered, city and county, school district, special district, authority, agency, any other municipal public corporation or district, or other political subdivision of the state.

(d) "Public facilities" includes public improvements, public services, and community amenities.

66000.5. (a) This chapter, Chapter 6 (commencing with Section 66010), Chapter 7 (commencing with Section 66012), Chapter 8 (commencing with Section 66016), and Chapter 9 (commencing with Section 66020) shall be known and may be cited as the Mitigation Fee Act.

(b) Any action brought in the superior court relating to the Mitigation Fee Act may be subject to a mediation proceeding conducted pursuant to Chapter 9.3 (commencing with Section 66030).

66001. (a) In any action establishing, increasing, or imposing a fee as a condition of approval of a development project by a local agency, the local agency shall do all of the following:

(1) Identify the purpose of the fee.

(2) Identify the use to which the fee is to be put. If the use is financing public facilities, the facilities shall be identified. That identification may, but need not, be made by reference to a capital

improvement plan as specified in Section 65403 or 66002, may be made in applicable general or specific plan requirements, or may be made in other public documents that identify the public facilities for which the fee is charged.

(3) Determine how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.

(4) Determine how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.

(b) In any action imposing a fee as a condition of approval of a development project by a local agency, the local agency shall determine how there is a reasonable relationship between the amount of the fee and the cost of the public facility or portion of the public facility attributable to the development on which the fee is imposed.

(c) Upon receipt of a fee subject to this section, the local agency shall deposit, invest, account for, and expend the fees pursuant to Section 66006.

(d) (1) For the fifth fiscal year following the first deposit into the account or fund, and every five years thereafter, the local agency shall make all of the following findings with respect to that portion of the account or fund remaining unexpended, whether committed or uncommitted:

(A) Identify the purpose to which the fee is to be put.

(B) Demonstrate a reasonable relationship between the fee and the purpose for which it is charged.

(C) Identify all sources and amounts of funding anticipated to complete financing in incomplete improvements identified in paragraph (2) of subdivision (a).

(D) Designate the approximate dates on which the funding referred to in subparagraph (C) is expected to be deposited into the appropriate account or fund.

(2) When findings are required by this subdivision, they shall be made in connection with the public information required by subdivision (b) of Section 66006. The findings required by this subdivision need only be made for moneys in possession of the local agency, and need not be made with respect to letters of credit, bonds, or other instruments taken to secure payment of the fee at a future date. If the findings are not made as required by this subdivision, the local agency shall refund the moneys in the account or fund as provided in subdivision (e).

(e) Except as provided in subdivision (f), when sufficient funds have been collected, as determined pursuant to subparagraph (F) of paragraph (1) of subdivision (b) of Section 66006, to complete financing on incomplete public improvements identified in paragraph (2) of subdivision (a), and the public improvements remain incomplete, the local agency shall identify, within 180 days of the determination that sufficient funds have been collected, an approximate date by which the construction of the public improvement will be commenced, or shall refund to the then current record owner or owners of the lots or units, as identified on the last equalized assessment roll, of the development project or projects on a prorated basis, the unexpended portion of the fee, and any interest accrued thereon. By means consistent with the intent of this section, a local agency may refund the unexpended revenues by direct payment, by providing a temporary suspension of fees, or by any other reasonable

means. The determination by the governing body of the local agency of the means by which those revenues are to be refunded is a legislative act.

(f) If the administrative costs of refunding unexpended revenues pursuant to subdivision (e) exceed the amount to be refunded, the local agency, after a public hearing, notice of which has been published pursuant to Section 6061 and posted in three prominent places within the area of the development project, may determine that the revenues shall be allocated for some other purpose for which fees are collected subject to this chapter and which serves the project on which the fee was originally imposed.

(g) A fee shall not include the costs attributable to existing deficiencies in public facilities, but may include the costs attributable to the increased demand for public facilities reasonably related to the development project in order to (1) refurbish existing facilities to maintain the existing level of service or (2) achieve an adopted level of service that is consistent with the general plan.

66002. (a) Any local agency which levies a fee subject to Section 66001 may adopt a capital improvement plan, which shall indicate the approximate location, size, time of availability, and estimates of cost for all facilities or improvements to be financed with the fees.

(b) The capital improvement plan shall be adopted by, and shall be annually updated by, a resolution of the governing body of the local agency adopted at a noticed public hearing. Notice of the hearing shall be given pursuant to Section 65090. In addition, mailed notice shall be given to any city or county which may be significantly affected by the capital improvement plan. This notice shall be given no later than the date the local agency notices the public hearing pursuant to Section 65090. The information in the notice shall be not less than the information contained in the notice of public hearing and shall be given by first-class mail or personal delivery.

(c) "Facility" or "improvement," as used in this section, means any of the following:

(1) Public buildings, including schools and related facilities; provided that school facilities shall not be included if Senate Bill 97 of the 1987-88 Regular Session is enacted and becomes effective on or before January 1, 1988.

(2) Facilities for the storage, treatment, and distribution of nonagricultural water.

(3) Facilities for the collection, treatment, reclamation, and disposal of sewage.

(4) Facilities for the collection and disposal of storm waters and for flood control purposes.

(5) Facilities for the generation of electricity and the distribution of gas and electricity.

(6) Transportation and transit facilities, including but not limited to streets and supporting improvements, roads, overpasses, bridges, harbors, ports, airports, and related facilities.

(7) Parks and recreation facilities.

(8) Any other capital project identified in the capital facilities plan adopted pursuant to Section 66002.

66003. Sections 66001 and 66002 do not apply to a fee imposed pursuant to a reimbursement agreement by and between a local agency and a property owner or developer for that portion of the cost of a public facility paid by the property owner or developer which exceeds the need for the public facility attributable to and reasonably related to the development. This chapter shall become operative on January 1, 1989.

66004. The establishment or increase of any fee pursuant to this chapter shall be subject to the requirements of Section 66018.

66005. (a) When a local agency imposes any fee or exaction as a condition of approval of a proposed development, as defined by Section 65927, or development project, those fees or exactions shall not exceed the estimated reasonable cost of providing the service or facility for which the fee or exaction is imposed.

(b) This section does not apply to fees or monetary exactions expressly authorized to be imposed under Sections 66475.1 and 66477.

(c) It is the intent of the Legislature in adding this section to codify existing constitutional and decisional law with respect to the imposition of development fees and monetary exactions on developments by local agencies. This section is declaratory of existing law and shall not be construed or interpreted as creating new law or as modifying or changing existing law.

66005.1. (a) When a local agency imposes a fee on a housing development pursuant to Section 66001 for the purpose of mitigating vehicular traffic impacts, if that housing development satisfies all of the following characteristics, the fee, or the portion thereof relating to vehicular traffic impacts, shall be set at a rate that reflects a lower rate of automobile trip generation associated with such housing developments in comparison with housing developments without these characteristics, unless the local agency adopts findings after a public hearing establishing that the housing development, even with these characteristics, would not generate fewer automobile trips than a housing development without those characteristics:

(1) The housing development is located within one-half mile of a transit station and there is direct access between the housing development and the transit station along a barrier-free walkable pathway not exceeding one-half mile in length.

(2) Convenience retail uses, including a store that sells food, are located within one-half mile of the housing development.

(3) The housing development provides either the minimum number of parking spaces required by the local ordinance, or no more than one onsite parking space for zero to two bedroom units, and two onsite parking spaces for three or more bedroom units, whichever is less.

(b) If a housing development does not satisfy the characteristics in subdivision (a), the local agency may charge a fee that is proportional to the estimated rate of automobile trip generation associated with the housing development.

(c) As used in this section, "housing development" means a development project with common ownership and financing consisting of residential use or mixed use where not less than 50 percent of the floorspace is for residential use.

(d) For the purposes of this section, "transit station" has the meaning set forth in paragraph (4) of subdivision (b) of Section 65460.1. "Transit station" includes planned transit stations otherwise meeting this definition whose construction is programmed to be completed prior to the scheduled completion and occupancy of the housing development.

(e) This section shall become operative on January 1, 2011.

66006. (a) If a local agency requires the payment of a fee specified in subdivision (c) in connection with the approval of a development project, the local agency receiving the fee shall deposit it with the other fees for the improvement in a separate capital facilities account or fund in a manner to avoid any commingling of the fees with other revenues and funds of the local agency, except for temporary investments, and expend those fees solely for the purpose for which the fee was collected. Any interest income earned by moneys in the capital facilities account or fund shall also be deposited in that account or fund and shall be expended only for the purpose for which the fee was originally collected.

(b) (1) For each separate account or fund established pursuant to subdivision (a), the local agency shall, within 180 days after the last day of each fiscal year, make available to the public the following information for the fiscal year:

(A) A brief description of the type of fee in the account or fund.

(B) The amount of the fee.

(C) The beginning and ending balance of the account or fund.

(D) The amount of the fees collected and the interest earned.

(E) An identification of each public improvement on which fees were expended and the amount of the expenditures on each improvement, including the total percentage of the cost of the public improvement that was funded with fees.

(F) An identification of an approximate date by which the construction of the public improvement will commence if the local agency determines that sufficient funds have been collected to complete financing on an incomplete public improvement, as identified in paragraph (2) of subdivision (a) of Section 66001, and the public improvement remains incomplete.

(G) A description of each interfund transfer or loan made from the account or fund, including the public improvement on which the transferred or loaned fees will be expended, and, in the case of an interfund loan, the date on which the loan will be repaid, and the rate of interest that the account or fund will receive on the loan.

(H) The amount of refunds made pursuant to subdivision (e) of Section 66001 and any allocations pursuant to subdivision (f) of Section 66001.

(2) The local agency shall review the information made available to the public pursuant to paragraph (1) at the next regularly scheduled public meeting not less than 15 days after this information is made available to the public, as required by this subdivision. Notice of the time and place of the meeting, including the address

where this information may be reviewed, shall be mailed, at least 15 days prior to the meeting, to any interested party who files a written request with the local agency for mailed notice of the meeting. Any written request for mailed notices shall be valid for one year from the date on which it is filed unless a renewal request is filed. Renewal requests for mailed notices shall be filed on or before April 1 of each year. The legislative body may establish a reasonable annual charge for sending notices based on the estimated cost of providing the service.

(c) For purposes of this section, "fee" means any fee imposed to provide for an improvement to be constructed to serve a development project, or which is a fee for public improvements within the meaning of subdivision (b) of Section 66000, and that is imposed by the local agency as a condition of approving the development project.

(d) Any person may request an audit of any local agency fee or charge that is subject to Section 66023, including fees or charges of school districts, in accordance with that section.

(e) The Legislature finds and declares that untimely or improper allocation of development fees hinders economic growth and is, therefore, a matter of statewide interest and concern. It is, therefore, the intent of the Legislature that this section shall supersede all conflicting local laws and shall apply in charter cities.

(f) At the time the local agency imposes a fee for public improvements on a specific development project, it shall identify the public improvement that the fee will be used to finance.

66006.5. (a) A city or county which imposes an assessment, fee, or charge, other than a tax, for transportation purposes may, by ordinance, prescribe conditions and procedures allowing real property which is needed by the city or county for local transportation purposes, or by the state for transportation projects which will not receive any federal funds, to be donated by the obligor in satisfaction or partial satisfaction of the assessment, fee, or charge.

(b) To facilitate the implementation of subdivision (a), the Department of Transportation shall do all of the following:

(1) Give priority to the refinement, modification, and enhancement of procedures and policies dealing with right-of-way donations in order to encourage and facilitate those donations.

(2) Reduce or simplify paperwork requirements involving right-of-way procurement.

(3) Increase communication and education efforts as a means to solicit and encourage voluntary right-of-way donations.

(4) Enhance communication and coordination with local public entities through agreements of understanding that address state acceptance of right-of-way donations.

66007. (a) Except as otherwise provided in subdivisions (b) and (g), any local agency that imposes any fees or charges on a residential development for the construction of public improvements or facilities shall not require the payment of those fees or charges, notwithstanding any other provision of law, until the date of the

final inspection, or the date the certificate of occupancy is issued, whichever occurs first. However, utility service fees may be collected at the time an application for utility service is received. If the residential development contains more than one dwelling, the local agency may determine whether the fees or charges shall be paid on a pro rata basis for each dwelling when it receives its final inspection or certificate of occupancy, whichever occurs first; on a pro rata basis when a certain percentage of the dwellings have received their final inspection or certificate of occupancy, whichever occurs first; or on a lump-sum basis when the first dwelling in the development receives its final inspection or certificate of occupancy, whichever occurs first.

(b) (1) Notwithstanding subdivision (a), the local agency may require the payment of those fees or charges at an earlier time if (A) the local agency determines that the fees or charges will be collected for public improvements or facilities for which an account has been established and funds appropriated and for which the local agency has adopted a proposed construction schedule or plan prior to final inspection or issuance of the certificate of occupancy or (B) the fees or charges are to reimburse the local agency for expenditures previously made. "Appropriated," as used in this subdivision, means authorization by the governing body of the local agency for which the fee is collected to make expenditures and incur obligations for specific purposes.

(2) (A) Paragraph (1) does not apply to units reserved for occupancy by lower income households included in a residential development proposed by a nonprofit housing developer in which at least 49 percent of the total units are reserved for occupancy by lower income households, as defined in Section 50079.5 of the Health and Safety Code, at an affordable rent, as defined in Section 50053 of the Health and Safety Code. In addition to the contract that may be required under subdivision (c), a city, county, or city and county may require the posting of a performance bond or a letter of credit from a federally insured, recognized depository institution to guarantee payment of any fees or charges that are subject to this paragraph. Fees and charges exempted from paragraph (1) under this paragraph shall become immediately due and payable when the residential development no longer meets the requirements of this paragraph.

(B) The exception provided in subparagraph (A) does not apply to fees and charges levied pursuant to Chapter 6 (commencing with Section 17620) of Part 10.5 of Division 1 of Title 1 of the Education Code.

(c) (1) If any fee or charge specified in subdivision (a) is not fully paid prior to issuance of a building permit for construction of any portion of the residential development encumbered thereby, the local agency issuing the building permit may require the property owner, or lessee if the lessee's interest appears of record, as a condition of issuance of the building permit, to execute a contract to pay the fee or charge, or applicable portion thereof, within the time specified in subdivision (a). If the fee or charge is prorated pursuant to subdivision (a), the obligation under the contract shall be similarly prorated.

(2) The obligation to pay the fee or charge shall inure to the benefit of, and be enforceable by, the local agency that imposed the fee or charge, regardless of whether it is a party to the contract. The contract shall contain a legal description of the property

affected, shall be recorded in the office of the county recorder of the county and, from the date of recordation, shall constitute a lien for the payment of the fee or charge, which shall be enforceable against successors in interest to the property owner or lessee at the time of issuance of the building permit. The contract shall be recorded in the grantor-grantee index in the name of the public agency issuing the building permit as grantee and in the name of the property owner or lessee as grantor. The local agency shall record a release of the obligation, containing a legal description of the property, in the event the obligation is paid in full, or a partial release in the event the fee or charge is prorated pursuant to subdivision (a).

(3) The contract may require the property owner or lessee to provide appropriate notification of the opening of any escrow for the sale of the property for which the building permit was issued and to provide in the escrow instructions that the fee or charge be paid to the local agency imposing the same from the sale proceeds in escrow prior to disbursing proceeds to the seller.

(d) This section applies only to fees collected by a local agency to fund the construction of public improvements or facilities. It does not apply to fees collected to cover the cost of code enforcement or inspection services, or to other fees collected to pay for the cost of enforcement of local ordinances or state law.

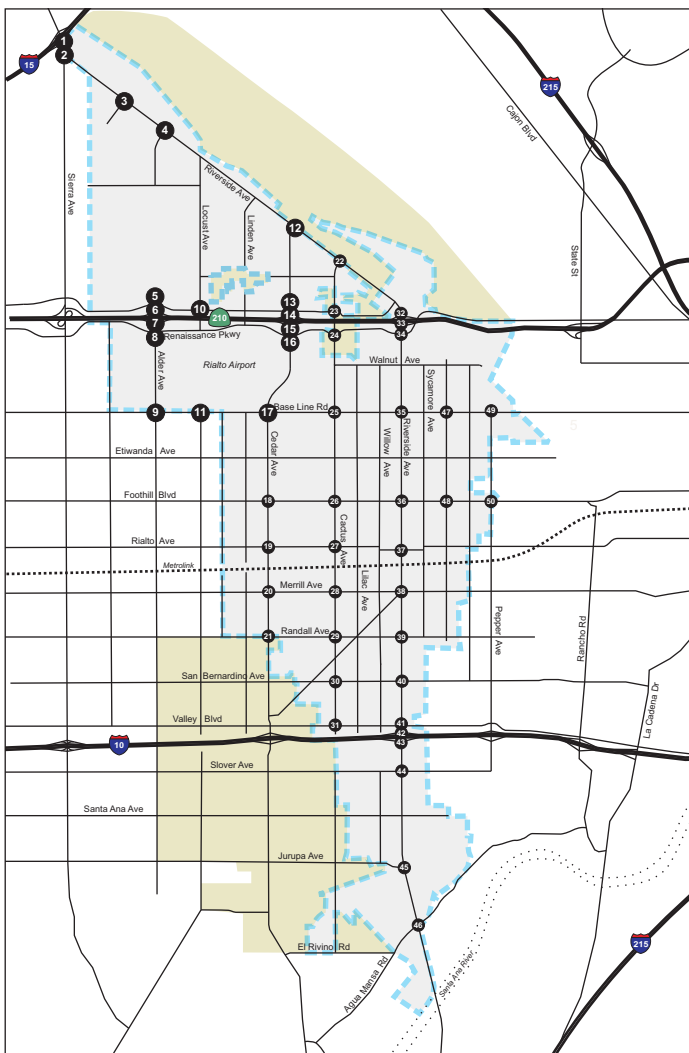
(e) "Final inspection" or "certificate of occupancy," as used in this section, have the same meaning as described in Sections 305 and 307 of the Uniform Building Code, International Conference of Building Officials, 1985 edition.

(f) Methods of complying with the requirement in subdivision (b) that a proposed construction schedule or plan be adopted, include, but are not limited to, (1) the adoption of the capital improvement plan described in Section 66002, or (2) the submittal of a five-year plan for construction and rehabilitation of school facilities pursuant to subdivision (c) of Section 17017.5 of the Education Code.

(g) A local agency may defer the collection of one or more fees up to the close of escrow. This subdivision shall not apply to fees and charges levied pursuant to Chapter 6 (commencing with Section 17620) of Part 10.5 of Division 1 of Title 1 of the Education Code.

66008. A local agency shall expend a fee for public improvements, as accounted for pursuant to Section 66006, solely and exclusively for the purpose or purposes, as identified in subdivision (f) of Section 66006, for which the fee was collected. The fee shall not be levied, collected, or imposed for general revenue purposes.

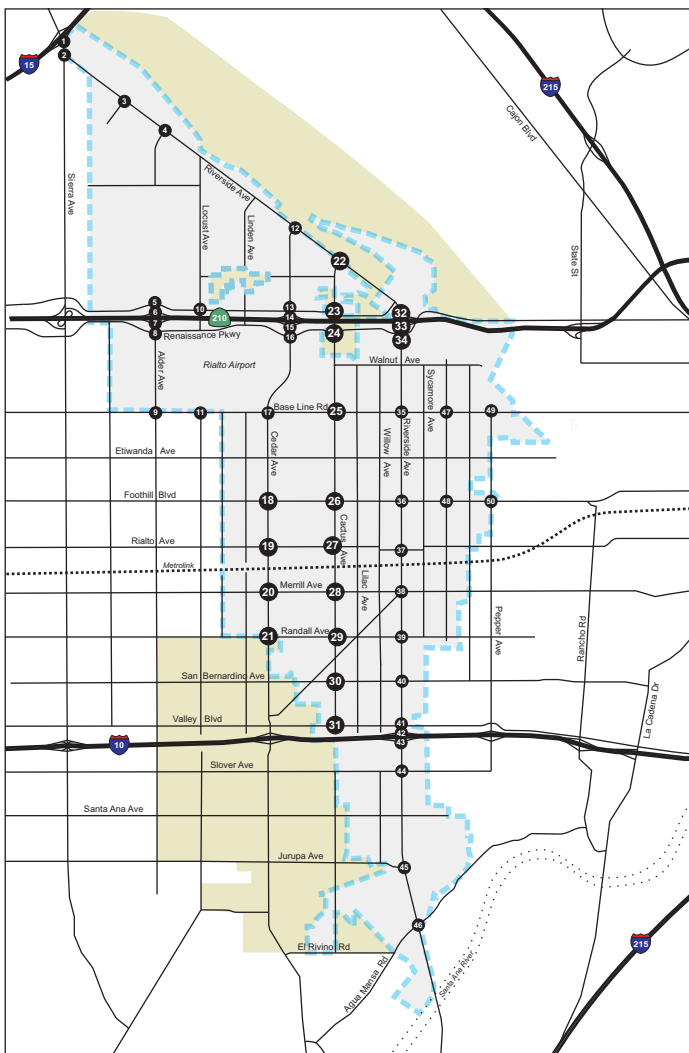
APPENDIX B: TRAFFIC VOLUMES



1. Sierra Ave & I-15 NB Ramp 606/324 47/124 197/276 1/9 114/251 155/314 515/334	2. Sierra Ave & Riverside Ave 369/224 306/392 118/146 168/386 394/281 152/85	3. Live Oak Ave & Riverside Ave 280/242 20/62 316/224 143/258 64/25 336/178	4. Alder Ave & Riverside Ave 205/268 89/141 326/192 49/66 166/58 97/47	5. Alder Ave & Sierra Lakes Pkwy 23/8 37/144 310/283 5/5 40/168 31/98 245/278 109/147 36/57
6. Alder Ave & SR-210 WB Ramps 513/327 169/221 84/60 1/1 226/174 363/432 390/308	7. Alder Ave & SR-210 EB Ramps 263/246 161/119 181/293 2/2 300/298 191/180 392/394	8. Alder Ave & Renaissance Pkwy 26/47 461/477 65/21 66/46 65/65 76/12 19/63 68/49 62/55	9. Alder Ave & Base Line Rd 77/26 351/304 159/44 76/36 386/309 66/143 195/62 297/316 42/180	10. Locust Ave & Sierra Lakes Pkwy 244/282 97/165 17/44 187/248 47/153 2/5 36/34 59/91 1/1
11. Locust Ave & Base Line Rd 3/4 1/0 3/0 7/0 228/401 64/120 3/1 248/330 23/35	12. Ayala Dr & Riverside Ave 392/403 111/90 436/335 89/70 150/57 80/64	13. Ayala Dr & Casmalia St 15/8 639/314 1/15 7/28 49/65 197/134 20/10 36/34 193/108	14. Ayala Dr & SR-210 WB Ramps 407/196 600/354 405/532 743/505 206/200 3/6 362/298	15. Ayala Dr & SR-210 EB Ramps 0/1 486/421 237/139 83/224 1/3 321/549 291/306 809/633
16. Ayala Dr & Renaissance Pkwy 6/4 684/747 7/9/225 28/29 61/49 160/121 266/115 69/27 8/13	17. Cedar Ave & Base Line Rd 50/51 596/553 4/17/9 145/145 253/290 58/50 61/56 267/288 61/107			



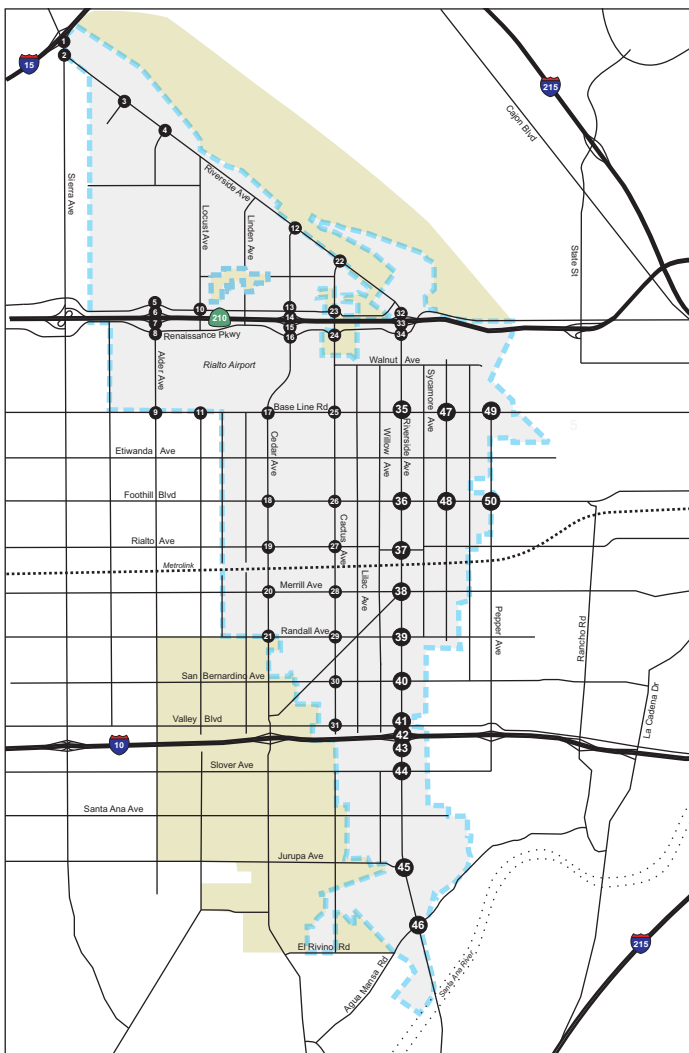
Legend	
	City of Rialto
	Sphere of Influence
	Study Intersection



18. Cedar Ave & Foothill Blvd ↖ 68/69 ↘ 736/507 ↙ 119/112 ↖ 51/80 ↙ 423/545 ↘ 92/145 ↗ 74/144 ↘ 380/594 ↙ 98/106 ↖ 120/104 ↗ 475/592 ↙ 109/157	19. Cedar Ave & Rialto Ave ↖ 83/86 ↘ 712/619 ↙ 204/74 ↖ 285/115 ↙ 214/140 ↘ 156/73 ↗ 52/97 ↘ 167/192 ↙ 196/160 ↖ 154/55 ↗ 526/774 ↙ 131/157	20. Cedar Ave & Merrill Ave ↖ 27/117 ↘ 596/669 ↙ 56/22 ↖ 101/92 ↙ 744/214 ↘ 124/51 ↗ 61/128 ↘ 224/251 ↙ 156/66 ↖ 65/31 ↗ 182/749 ↙ 92/75	21. Cedar Ave & Randall Ave ↖ 39/26 ↘ 824/681 ↙ 64/67 ↖ 42/52 ↙ 92/88 ↘ 66/36 ↗ 40/41 ↘ 92/120 ↙ 56/41 ↖ 24/63 ↗ 638/810 ↙ 32/41	22. Cactus Ave & Riverside Ave ↖ 106/10 ↘ 36/14 ↙ 76/22 ↖ 12/24 ↙ 43/396 ↘ 35/58 ↗ 97/7 ↘ 311/371 ↙ 9/30 ↖ 89/47 ↗ 475/18 ↙ 8/40
23. Cactus Ave & Casmalia St ↖ 40/19 ↘ 376/117 ↙ 11/17 ↖ 15/5 ↙ 22/19 ↘ 16/13 ↗ 16/19 ↘ 38/37 ↙ 144/52 ↖ 22/25 ↗ 305/170 ↙ 202/70	24. Cactus Ave & Easton St ↖ 52/8 ↘ 383/153 ↙ 111/25 ↖ 144/29 ↙ 53/44 ↘ 38/43 ↗ 59/9 ↘ 30/81 ↙ 67/131 ↖ 50/35 ↗ 356/230 ↙ 152/98	25. Cactus Ave & Base Line Rd ↖ 117/60 ↘ 495/210 ↙ 160/74 ↖ 142/71 ↙ 559/375 ↘ 190/101 ↗ 102/75 ↘ 549/432 ↙ 115/94 ↖ 164/90 ↗ 428/240 ↙ 92/64	26. Cactus Ave & Foothill Blvd ↖ 48/33 ↘ 472/221 ↙ 79/67 ↖ 51/111 ↙ 508/668 ↘ 108/89 ↗ 34/57 ↘ 567/741 ↙ 65/43 ↖ 80/39 ↗ 251/328 ↙ 48/4	27. Cactus Ave & Rialto Ave ↖ 364/59 ↘ 457/316 ↙ 76/55 ↖ 57/67 ↙ 359/177 ↘ 31/22 ↗ 96/87 ↘ 260/250 ↙ 108/83 ↖ 24/26 ↗ 251/390 ↙ 130/56
28. Cactus Ave & Merrill Ave ↖ 71/54 ↘ 450/305 ↙ 64/67 ↖ 76/51 ↙ 235/205 ↘ 33/30 ↗ 72/60 ↘ 233/280 ↙ 29/30 ↖ 38/25 ↗ 297/368 ↙ 27/21	29. Cactus Ave & Randall Ave ↖ 23/10 ↘ 411/376 ↙ 90/35 ↖ 55/37 ↙ 105/131 ↘ 13/40 ↗ 32/6 ↘ 127/102 ↙ 62/30 ↖ 31/31 ↗ 211/294 ↙ 40/33	30. Cactus Ave & San Bernadino Ave ↖ 57/35 ↘ 174/168 ↙ 41/17 ↖ 2/5 ↙ 246/198 ↘ 85/37 ↗ 46/26 ↘ 122/256 ↙ 7/13 ↖ 67/61 ↗ 146/118 ↙ 27/5	31. Cactus Ave & Valley Blvd ↖ 116/66 ↘ 1/0 ↙ 244/185 ↖ 168/209 ↙ 466/392 ↘ 2/1 ↗ 87/93 ↘ 324/468 ↙ 0/6 ↖ 1/5 ↗ 0/1 ↙ 0/5	32. Riverside Ave & I-210 WB Ramp ↖ 246/142 ↘ 97/686 ↖ 319/358 ↙ 3/2 ↘ 649/585 ↖ 565/716 ↙ 879/652
33. Riverside Ave & I-210 EB Ramp ↖ 853/802 ↘ 364/261 ↖ 108/145 ↙ 1/1 ↘ 481/703 ↖ 433/534 ↙ 989/959	34. Riverside Ave & Easton St ↖ 254/228 ↙ 80/93 ↘ 75/117 ↖ 76/139 ↙ 757/955 ↘ 59/86 ↖ 298/221 ↙ 83/95 ↘ 67/35			



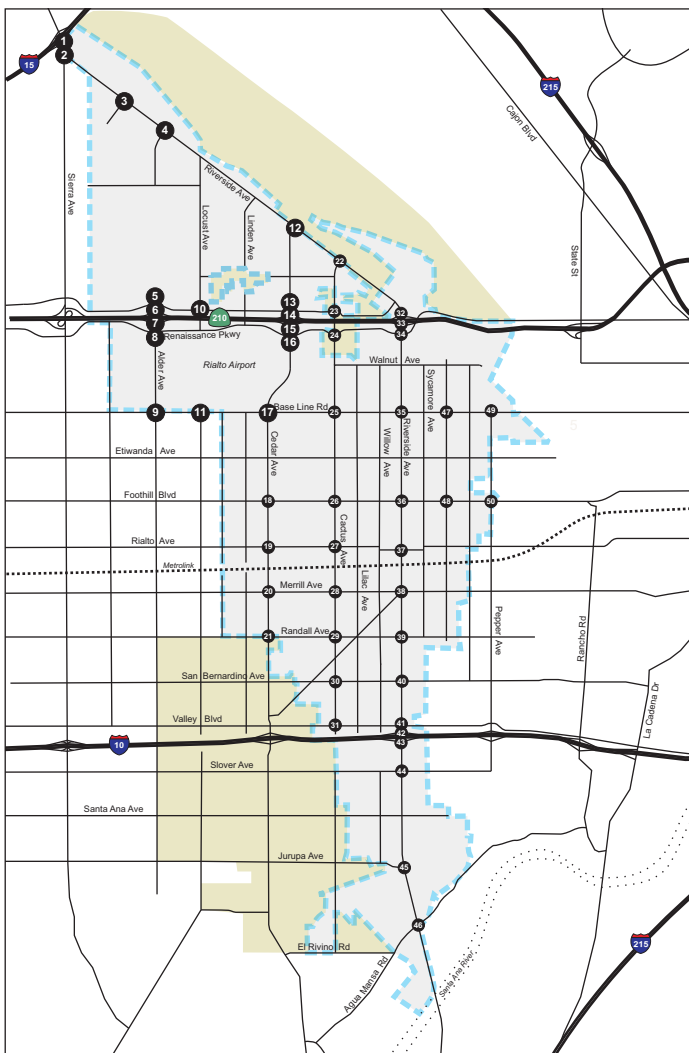
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	City of Rialto
	Sphere of Influence
	Study Intersection



35. Riverside Ave & Base Line Rd 51/79 881/644 243/208 115/147 604/541 55/122 85/154 550/485 68/69 25/75 426/592 131/112	36. Riverside Ave & Foothill Blvd 100/111 480/420 181/240 116/153 545/645 100/89 95/140 630/628 74/84 81/63 292/581 122/199	37. Riverside Ave & Rialto Ave 15/19 572/568 14/29 3/14 86/82 79/54 13/50 93/109 39/94 39/71 446/716 52/89	38. Riverside Ave & Merrill Ave 138/114 524/98 59/24 61/3 297/64 114/289 37/36 260/253 84/82 36/44 441/748 87/127	39. Riverside Ave & Randall Ave 56/44 655/635 25/24 57/35 161/68 149/68 37/26 121/57 72/63 115/94 499/935 58/67
40. Riverside Ave & San Bernadino Ave 51/24 659/475 77/64 77/63 121/88 225/197 29/40 141/120 152/90 104/300 441/911 65/124	41. Riverside Ave & Valley Blvd 32/54 878/695 66/72 35/71 177/213 230/201 36/93 147/190 504/420 174/293 651/1092 371/542	42. Riverside Ave & I-10 WB Ramp 565/295 1078/62 390/471 2/1 399/304 802/664 184/291	43. Riverside Ave & I-10 EB Ramp 996/752 114/413 402/41 302/808 10/4 376/284 302/407 700/1122	44. Riverside Ave & Slover Ave 245/199 1255/887 23/32 14/23 10/19 22/22 211/332 20/39 40/61 9/21 869/1251 61/69
45. Riverside Ave & Jurupa Ave 46/63 1074/1014 40/49 84/99 846/170 71/71	46. Riverside Ave & Agua Mansa Rd 152/105 815/812 74/73 42/43 217/138 66/53 128/160 137/366 80/89 49/96 643/873 133/112	47. Acacia Ave & Base Line Rd 24/34 32/47 81/23 10/20 315/560 11/10 8/33 278/533 18/50 10/23 41/88 14/37	48. Acacia Ave & Foothill Blvd 55/58 128/103 13/4 29/63 641/716 23/29 33/50 753/773 68/69 45/42 122/100 60/67	49. Pepper Ave & Base Line Rd 16/11 81/24 30/23 41/13 343/410 90/77 12/10 289/404 186/172 51/113 84/47 181/200
50. Pepper Ave & Foothill Blvd 77/79 334/230 61/46 72/36 422/496 150/81 52/103 499/487 175/170 128/164 260/336 116/151				



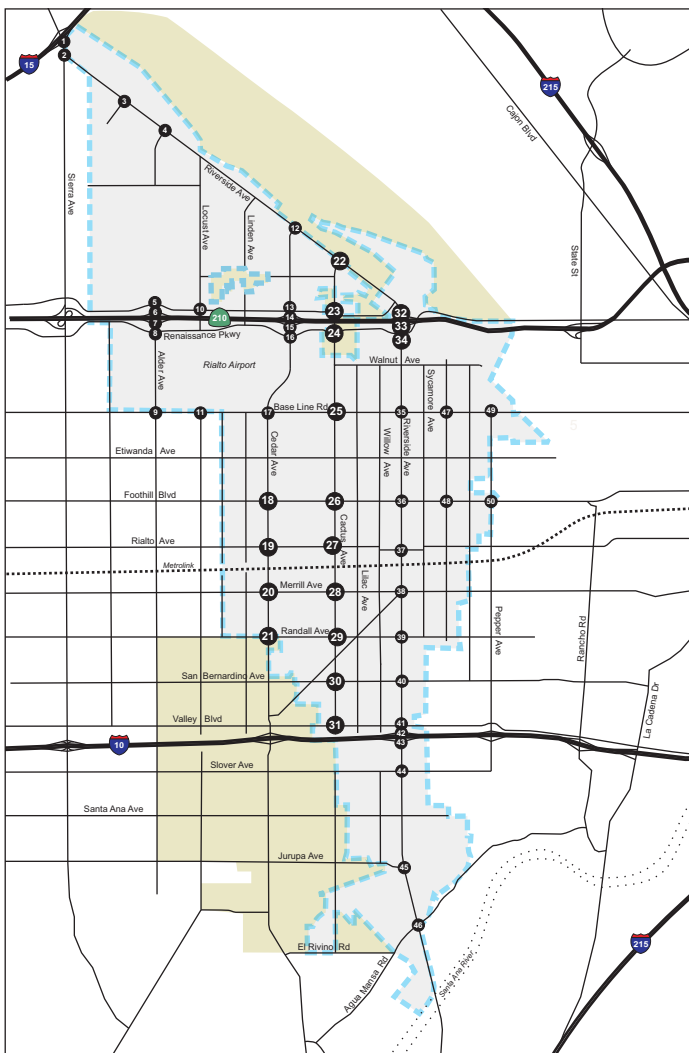
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	City of Rialto
	Sphere of Influence
	Study Intersection



1. Sierra Ave & I-15 NB Ramp 1752/586 94/298 196/163 2/4 262/81 312/805 645/1186	2. Sierra Ave & Riverside Ave 49/33 958/444 683/353 14/112 34/307 0/0 671/724 156/58 10/13 8/22 411/928 0/0	3. Live Oak Ave & Riverside Ave 636/893 32/94 967/597 151/108 112/60 281/161	4. Alder Ave & Riverside Ave 568/683 174/120 770/563 255/205 123/124 224/319	5. Alder Ave & Sierra Lakes Pkwy 13/24 478/385 25/4 8/15 33/162 65/137 31/23 35/150 530/372 301/299 273/497 63/71
6. Alder Ave & SR-210 WB Ramps 643/477 430/420 99/71 1/2 409/2996 543/794 436/627	7. Alder Ave & SR-210 EB Ramps 785/570 96/160 7/6 247/337 2/1 697/380 272/331 734/1084	8. Alder Ave & Renaissance Pkwy 105/151 642/530 89/530 642/530 165/154 180/296 39/5 170/520 221/165 100/60 25/78 681/742 35/3	9. Alder Ave & Base Line Rd 107/95 323/347 14/4 8/4 150/55 811/896 244/512 195/21 839/834 79/147 87/62 340/337 432/309	10. Locust Ave & Sierra Lakes Pkwy 272/303 285/330 13/3 133/232 30/185 10/17 24/17 103/92 5/2 0/7 173/302 29/30
11. Locust Ave & Base Line Rd 46/199 7/36 61/34 6/1 143/74 730/525 21/59 160/94 304/921 39/130 51/27 20/19 110/71	12. Ayala Dr & Riverside Ave 722/484 201/208 499/666 98/104 238/212 124/92	13. Ayala Dr & Casmalia St 28/21 34/563 3/20 11/59 63/115 205/151 37/18 68/47 222/107 113/123 551/649 175/136	14. Ayala Dr & SR-210 WB Ramps 391/290 169/531 338/250 3/7 559/351 491/647 641/553	15. Ayala Dr & SR-210 EB Ramps 903/586 429/296 114/230 1/4 415/513 336/657 1017/970
16. Ayala Dr & Renaissance Pkwy 134/33 947/678 360/207 209/64 2/3 132/370 70/142 125/213 3/7 863/1051 265/120	17. Cedar Ave & Base Line Rd 501/03 909/609 051/1001 249/398 420/908 135/134 47/54 1047/631 65/100 98/178 611/551 147/143			



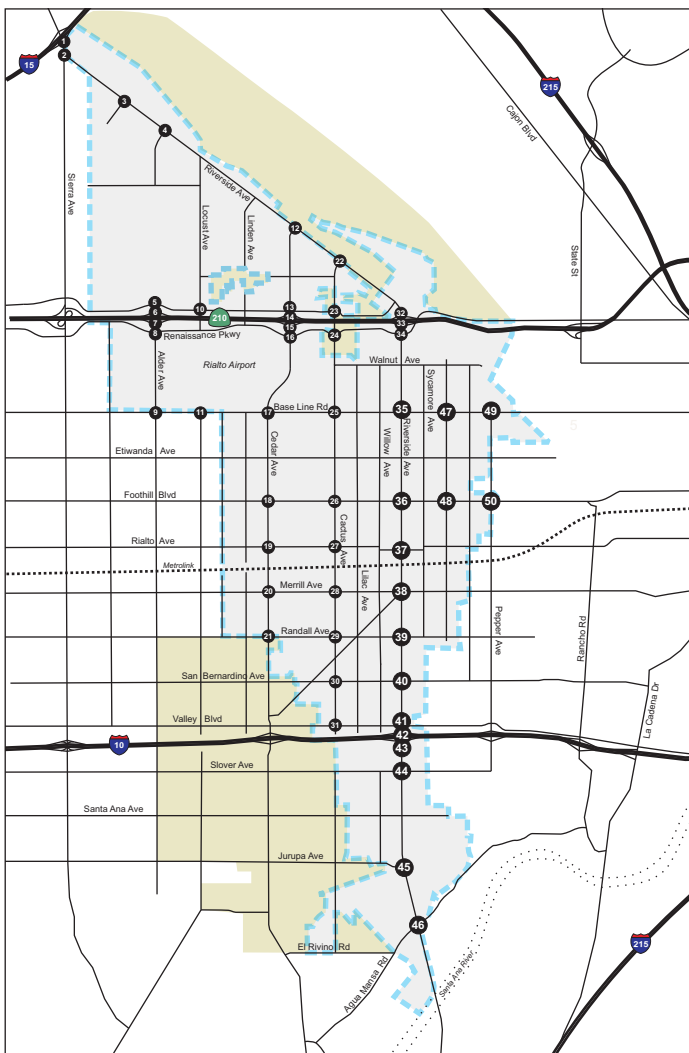
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	City of Rialto
	Sphere of Influence
	Study Intersection



18. Cedar Ave & Foothill Blvd 81/74 820/569 133/167 98/102 920/820 186/227 106/166 573/1129 148/150 152/223 156/204 581/708	19. Cedar Ave & Rialto Ave 68/50 880/779 201/88 296/123 232/133 257/150 31/65 123/231 181/205 248/127 667/995 173/179	20. Cedar Ave & Merrill Ave 29/120 801/811 93/269 224/181 742/230 155/63 88/136 226/313 128/45 79/49 319/985 72/54	21. Cedar Ave & Randall Ave 84/48 968/722 62/89 42/70 110/82 43/19 59/82 73/127 53/33 15/40 753/976 45/34	22. Cactus Ave & Riverside Ave 198/30 141/12 37/43 23/34 460/570 114/82 94/24 440/849 14/103 132/62 484/36 43/62
23. Cactus Ave & Casmalia St 47/28 426/252 12/18 33/7 40/20 29/21 22/20 41/55 159/64 237/75 24/48 412/229	24. Cactus Ave & Easton St 90/29 402/238 136/1 235/51 109/72 47/30 85/29 37/187 74/168 44/31 375/276 201/112	25. Cactus Ave & Base Line Rd 55/70 568/396 41/111 134/45 1105/527 326/230 99/74 618/801 203/331 242/265 547/374 244/220	26. Cactus Ave & Foothill Blvd 113/89 811/677 94/107 75/141 924/821 143/124 66/156 695/1156 114/129 108/188 544/774 126/191	27. Cactus Ave & Rialto Ave 339/77 800/677 94/106 98/90 442/216 72/46 108/82 277/327 163/121 42/80 472/842 173/110
28. Cactus Ave & Merrill Ave 115/97 858/689 75/60 78/59 299/242 50/45 100/138 223/357 59/88 62/50 48/32 551/849	29. Cactus Ave & Randall Ave 30/15 837/771 114/66 96/59 107/118 21/51 43/7 99/85 78/28 37/60 445/781 49/50	30. Cactus Ave & San Bernadino Ave 109/95 402/356 56/101 19/72 390/287 162/59 90/108 169/437 3/6 91/90 278/426 8/2	31. Cactus Ave & Valley Blvd 123/69 107/1 54/386 281/405 599/457 2/2 84/99 421/602 0/5 1/7 0/1 0/3	32. Riverside Ave & I-210 WB Ramp 251/218 1034/113 1 514/423 2/2 501/449 857/815 612/450 1
33. Riverside Ave & I-210 EB Ramp 988/1041 543/534 1 142/211 1/1 320/435 376/394 1325/1053 1	34. Riverside Ave & Easton St 228/194 969/924 96/111 486/233 220/118 181/142 353/297 84/191 103/55 73/199 856/910 97/102			



Legend	
	City of Rialto
	Sphere of Influence
	Study Intersection



35. Riverside Ave & Base Line Rd 58/67 758/614 204/191 106/125 1032/742 94/190 76/155 679/861 111/128 32/119 405/533 230/163	36. Riverside Ave & Foothill Blvd 130/120 659/508 220/290 164/213 906/874 175/144 105/190 770/985 102/132 103/201 338/620 167/207	37. Riverside Ave & Rialto Ave 32/34 940/665 30/55 7/33 128/152 94/65 31/89 148/157 49/84 29/78 486/966 39/94	38. Riverside Ave & Merrill Ave 328/137 803/163 40/10 28/3 253/61 181/302 56/35 203/155 61/103 36/45 480/995 81/136	39. Riverside Ave & Randall Ave 71/42 846/583 37/37 62/49 196/78 186/74 28/35 124/96 63/64 118/141 385/1098 50/63
40. Riverside Ave & San Bernadino Ave 77/38 828/394 102/85 80/94 237/191 363/222 25/82 198/296 204/138 124/417 324/1039 90/206	41. Riverside Ave & Valley Blvd 34/45 1240/685 59/60 48/67 312/239 534/264 35/100 180/261 820/637 187/616 563/514 402/899	42. Riverside Ave & I-10 WB Ramp 344/331 2270/1267 205/381 1/1 820/434 952/2554 247/600	43. Riverside Ave & I-10 EB Ramp 2569/1265 528/440 316/772 8/4 601/413 302/837 907/2397	44. Riverside Ave & Slover Ave 317/178 2850/1453 36/0 14/16 10/6 22/13 176/427 15/0 42/67 10/0 1113/2798 57/71
45. Riverside Ave & Jurupa Ave 80/105 2448/1557 46/61 122/135 1135/2506 92/213	46. Riverside Ave & Agua Mansa Rd 363/116 1332 96/96 88/105 588/224 180/127 129/274 192/751 103/150 100/288 946/2172 253/184	47. Acacia Ave & Base Line Rd 27/26 64/100 92/23 11/35 703/786 41/40 3/33 333/834 26/118 48/52 75/125 49/44	48. Acacia Ave & Foothill Blvd 72/63 72/117 06/95 45/88 1194/1062 43/46 34/48 986/1378 88/74 56/84 123/108 74/77	49. Pepper Ave & Base Line Rd 330/348 566/378 613/281 215/110 401/317 35/30 184/275 201/430 212/208 126/4 443/687 211/258
50. Pepper Ave & Foothill Blvd 194/188 631/432 103/81 170/79 740/709 197/91 132/335 635/763 249/282 113/161 463/685 152/201				



Legend	
	City of Rialto
	Sphere of Influence
	Study Intersection

APPENDIX C: INTERSECTION LOS CALCULATION SHEETS

Rialto Impact Fee Study
1: Sierra Ave & I-15 NB Off Ramp/I-15 NB On Ramp

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop				Stop			Stop			Stop	
Volume (vph)	197	1	114	0	0	0	0	515	155	47	606	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	210	1	121	0	0	0	0	548	165	50	645	0
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	140	192	365	348	265	430						
Volume Left (vph)	140	70	0	0	50	0						
Volume Right (vph)	0	121	0	165	0	0						
Hadj (s)	0.53	-0.23	0.03	-0.30	0.13	0.03						
Departure Headway (s)	8.3	7.5	6.9	6.6	7.0	6.9						
Degree Utilization, x	0.32	0.40	0.70	0.63	0.51	0.82						
Capacity (veh/h)	401	442	508	530	502	512						
Control Delay (s)	14.0	14.4	23.3	19.0	16.0	33.3						
Approach Delay (s)	14.2		21.2		26.7							
Approach LOS	B		C		D							
Intersection Summary												
Delay			22.1									
Level of Service			C									
Intersection Capacity Utilization			58.8%	ICU Level of Service				B				
Analysis Period (min)			15									

Rialto Impact Fee Study
2: Sierra Ave & Riverside Ave

Existing Conditions
Timing Plan: AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	152	394	168	118	306	369
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	162	419	179	126	326	393
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	162	419	179	126	326	393
Volume Left (vph)	162	0	0	0	326	0
Volume Right (vph)	0	419	0	126	0	0
Hadj (s)	0.53	-0.67	0.03	-0.67	0.53	0.03
Departure Headway (s)	7.7	6.5	7.6	6.9	7.5	7.0
Degree Utilization, x	0.35	0.76	0.38	0.24	0.68	0.76
Capacity (veh/h)	451	536	445	496	473	506
Control Delay (s)	13.6	26.0	14.0	10.9	23.4	27.4
Approach Delay (s)	22.5		12.7		25.6	
Approach LOS	C		B		D	
Intersection Summary						
Delay			22.0			
Level of Service			C			
Intersection Capacity Utilization			47.7%		ICU Level of Service	A
Analysis Period (min)			15			

Rialto Impact Fee Study
3: Live Oak Ave & Riverside Ave

Existing Conditions
Timing Plan: AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Volume (vph)	316	143	20	280	336	64
Ideal Flow (vphpl)	1800	1800	1700	1800	1700	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.95		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3196		1583	3353	1583	1500
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3196		1583	3353	1583	1500
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	405	183	26	359	431	82
RTOR Reduction (vph)	56	0	0	0	0	49
Lane Group Flow (vph)	532	0	26	359	431	33
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	15.2		1.6	20.8	19.8	19.8
Effective Green, g (s)	15.2		1.6	20.8	19.8	19.8
Actuated g/C Ratio	0.31		0.03	0.43	0.41	0.41
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	999		52	1435	644	611
v/s Ratio Prot	c0.17		c0.02	0.11	c0.27	
v/s Ratio Perm						0.02
v/c Ratio	0.53		0.50	0.25	0.67	0.05
Uniform Delay, d1	13.8		23.1	8.9	11.7	8.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5		7.4	0.1	2.6	0.0
Delay (s)	14.3		30.5	9.0	14.4	8.8
Level of Service	B		C	A	B	A
Approach Delay (s)	14.3			10.4	13.5	
Approach LOS	B			B	B	
Intersection Summary						
HCM 2000 Control Delay			13.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.60			
Actuated Cycle Length (s)			48.6		Sum of lost time (s)	12.0
Intersection Capacity Utilization			46.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Rialto Impact Fee Study
4: Alder Ave & Riverside Ave

Existing Conditions
Timing Plan: AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Volume (vph)	326	49	89	205	97	166
Ideal Flow (vphpl)	1800	1800	1700	1800	1600	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3287		1583	3353	2891	1500
Flt Permitted	1.00		0.50	1.00	0.95	1.00
Satd. Flow (perm)	3287		839	3353	2891	1500
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	370	56	101	233	110	189
RTOR Reduction (vph)	16	0	0	0	0	147
Lane Group Flow (vph)	410	0	101	233	110	42
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	9.3		9.3	9.3	4.9	4.9
Effective Green, g (s)	9.3		9.3	9.3	4.9	4.9
Actuated g/C Ratio	0.42		0.42	0.42	0.22	0.22
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1376		351	1404	638	331
v/s Ratio Prot	c0.12			0.07	c0.04	
v/s Ratio Perm			0.12			0.03
v/c Ratio	0.30		0.29	0.17	0.17	0.13
Uniform Delay, d1	4.3		4.3	4.0	7.0	6.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		0.5	0.1	0.1	0.2
Delay (s)	4.4		4.7	4.1	7.1	7.1
Level of Service	A		A	A	A	A
Approach Delay (s)	4.4			4.3	7.1	
Approach LOS	A			A	A	
Intersection Summary						
HCM 2000 Control Delay			5.1		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.25			
Actuated Cycle Length (s)			22.2		Sum of lost time (s)	8.0
Intersection Capacity Utilization			30.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Rialto Impact Fee Study
5: Alder Ave & Sierra Lakes Pkwy/Casmalia St

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	40	45	453	37	23	42	125	280	17	184	6
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	1625		1583	1765	1500	1583	3005		1583	3353	1500
Flt Permitted	0.73	1.00		0.70	1.00	1.00	0.63	1.00		0.49	1.00	1.00
Satd. Flow (perm)	1219	1625		1165	1765	1500	1052	3005		814	3353	1500
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	42	47	472	39	24	44	130	292	18	192	6
RTOR Reduction (vph)	0	20	0	0	0	10	0	225	0	0	0	5
Lane Group Flow (vph)	5	69	0	472	39	14	44	197	0	18	192	1
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	22.6	22.6		22.6	22.6	22.6	9.2	9.2		9.2	9.2	9.2
Effective Green, g (s)	22.6	22.6		22.6	22.6	22.6	9.2	9.2		9.2	9.2	9.2
Actuated g/C Ratio	0.57	0.57		0.57	0.57	0.57	0.23	0.23		0.23	0.23	0.23
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)	692	922		661	1002	851	243	694		188	775	346
v/s Ratio Prot		0.04			0.02			c0.07			0.06	
v/s Ratio Perm	0.00			c0.40		0.01	0.04			0.02		0.00
v/c Ratio	0.01	0.07		0.71	0.04	0.02	0.18	0.28		0.10	0.25	0.00
Uniform Delay, d1	3.7	3.9		6.3	3.8	3.8	12.3	12.6		12.0	12.5	11.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	0.0		3.7	0.0	0.0	0.4	0.2		0.2	0.2	0.0
Delay (s)	3.7	3.9		9.9	3.8	3.8	12.6	12.8		12.3	12.6	11.8
Level of Service	A	A		A	A	A	B	B		B	B	B
Approach Delay (s)		3.9			9.2			12.8			12.6	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			10.7	HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			39.8	Sum of lost time (s)			8.0					
Intersection Capacity Utilization			61.2%	ICU Level of Service			B					
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
6: Alder Ave & I-210 WB On/I-210 WB Off

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	226	1	84	390	363	0	0	169	513
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		1.00	0.95			0.95	
Frt				1.00	0.85		1.00	1.00			0.89	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1583	1503		1583	3353			2975	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1583	1503		1583	3353			2975	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	243	1	90	419	390	0	0	182	552
RTOR Reduction (vph)	0	0	0	0	68	0	0	0	0	0	439	0
Lane Group Flow (vph)	0	0	0	243	23	0	419	390	0	0	295	0
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8								
Actuated Green, G (s)				15.4	15.4		22.5	39.4			12.9	
Effective Green, g (s)				15.4	15.4		22.5	39.4			12.9	
Actuated g/C Ratio				0.25	0.25		0.36	0.63			0.21	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				388	368		567	2103			611	
v/s Ratio Prot					0.02		c0.26	0.12			c0.10	
v/s Ratio Perm				c0.15								
v/c Ratio				0.63	0.06		0.74	0.19			0.48	
Uniform Delay, d1				21.1	18.2		17.6	4.9			22.0	
Progression Factor				1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2				3.1	0.1		5.0	0.0			0.6	
Delay (s)				24.3	18.2		22.6	5.0			22.6	
Level of Service				C	B		C	A			C	
Approach Delay (s)		0.0			22.6			14.1			22.6	
Approach LOS		A			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			19.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			62.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			70.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
7: Alder Ave & SR-210 EB Off/SR-210 EB On

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	238	2	300	0	0	0	0	515	191	58	337	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.96		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1681	1500					3217		1583	3353	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1681	1500					3217		1583	3353	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	256	2	323	0	0	0	0	554	205	62	362	0
RTOR Reduction (vph)	0	0	226	0	0	0	0	45	0	0	0	0
Lane Group Flow (vph)	0	258	97	0	0	0	0	714	0	62	362	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		15.6	15.6					20.2		4.4	28.6	
Effective Green, g (s)		15.6	15.6					20.2		4.4	28.6	
Actuated g/C Ratio		0.30	0.30					0.39		0.08	0.55	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		502	448					1244		133	1837	
v/s Ratio Prot								c0.22		c0.04	0.11	
v/s Ratio Perm		0.15	0.06									
v/c Ratio		0.51	0.22					0.57		0.47	0.20	
Uniform Delay, d1		15.2	13.7					12.6		22.8	6.0	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.9	0.2					0.6		2.6	0.1	
Delay (s)		16.1	14.0					13.3		25.4	6.0	
Level of Service		B	B					B		C	A	
Approach Delay (s)		14.9			0.0			13.3			8.9	
Approach LOS		B			A			B			A	
Intersection Summary												
HCM 2000 Control Delay		12.7						HCM 2000 Level of Service		B		
HCM 2000 Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		52.2						Sum of lost time (s)		12.0		
Intersection Capacity Utilization		70.6%						ICU Level of Service		C		
Analysis Period (min)		15										
c Critical Lane Group												

Rialto Impact Fee Study
8: Alder Ave & Renaissance Pkwy

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	65	76	62	68	25	65	605	17	70	532	35
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.96		1.00	1.00		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)	1583	3080		1583	3220		1583	3339		1583	1765	1500
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1583	3080		1583	3220		1583	3339		1583	1765	1500
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	84	71	84	68	75	27	71	665	19	77	585	38
RTOR Reduction (vph)	0	76	0	0	25	0	0	2	0	0	0	20
Lane Group Flow (vph)	84	79	0	68	77	0	71	682	0	77	585	18
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Prot
Protected Phases	7	4		3	8		5	2		1	6	6
Permitted Phases												
Actuated Green, G (s)	6.6	5.9		6.0	5.3		6.1	31.3		6.4	31.6	31.6
Effective Green, g (s)	6.6	5.9		6.0	5.3		6.1	31.3		6.4	31.6	31.6
Actuated g/C Ratio	0.10	0.09		0.09	0.08		0.09	0.48		0.10	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
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)	159	277		144	260		147	1593		154	850	722
v/s Ratio Prot	c0.05	c0.03		0.04	0.02		0.04	0.20		c0.05	c0.33	0.01
v/s Ratio Perm												
v/c Ratio	0.53	0.28		0.47	0.30		0.48	0.43		0.50	0.69	0.03
Uniform Delay, d1	28.0	27.9		28.3	28.4		28.3	11.3		28.1	13.2	8.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.1	0.6		2.4	0.6		2.5	0.2		2.5	2.3	0.0
Delay (s)	31.2	28.4		30.7	29.0		30.7	11.5		30.6	15.5	8.9
Level of Service	C	C		C	C		C	B		C	B	A
Approach Delay (s)		29.4			29.7			13.3			16.8	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay	18.2			HCM 2000 Level of Service					B			
HCM 2000 Volume to Capacity ratio	0.61											
Actuated Cycle Length (s)	65.6			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	55.2%			ICU Level of Service					B			
Analysis Period (min)	15											
c Critical Lane Group												

Rialto Impact Fee Study
9: Alder Ave & Base Line Rd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	386	66	42	297	195	146	323	77	159	351	77
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.94		1.00	0.97		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)	1583	1726		1583	1660		1583	1714		1583	1765	1500
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1583	1726		1583	1660		1583	1714		1583	1765	1500
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	88	449	77	49	345	227	170	376	90	185	408	90
RTOR Reduction (vph)	0	6	0	0	24	0	0	9	0	0	0	61
Lane Group Flow (vph)	88	520	0	49	548	0	170	457	0	185	408	29
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	6.0	36.8		4.0	34.8		11.0	32.0		12.0	33.0	33.0
Effective Green, g (s)	6.0	36.8		4.0	34.8		11.0	32.0		12.0	33.0	33.0
Actuated g/C Ratio	0.06	0.37		0.04	0.35		0.11	0.32		0.12	0.33	0.33
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)	94	630		62	573		172	544		188	577	491
v/s Ratio Prot	c0.06	0.30		0.03	c0.33		0.11	c0.27		c0.12	0.23	
v/s Ratio Perm												0.02
v/c Ratio	0.94	0.83		0.79	0.96		0.99	0.84		0.98	0.71	0.06
Uniform Delay, d1	47.2	29.1		48.0	32.3		44.8	32.0		44.3	29.7	23.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	71.5	8.7		48.2	26.9		64.6	14.5		60.6	7.1	0.2
Delay (s)	118.7	37.8		96.2	59.2		109.4	46.5		104.9	36.8	23.5
Level of Service	F	D		F	E		F	D		F	D	C
Approach Delay (s)		49.4			62.1			63.3			53.5	
Approach LOS		D			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			57.0			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			100.8			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			79.8%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
10: Locust Ave & Casmalia St

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	187	47	2	1	59	36	2	31	0	17	97	244
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.94		1.00	1.00		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1754		1583	1664		1583	3353		1583	2993	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1754		1583	1664		1583	3353		1583	2993	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	197	49	2	1	62	38	2	33	0	18	102	257
RTOR Reduction (vph)	0	1	0	0	24	0	0	0	0	0	199	0
Lane Group Flow (vph)	197	50	0	1	76	0	2	33	0	18	160	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.9	13.9		0.6	5.6		0.7	8.9		0.9	9.1	
Effective Green, g (s)	8.9	13.9		0.6	5.6		0.7	8.9		0.9	9.1	
Actuated g/C Ratio	0.22	0.34		0.01	0.14		0.02	0.22		0.02	0.23	
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)	349	604		23	231		27	740		35	675	
v/s Ratio Prot	c0.12	0.03		0.00	c0.05		0.00	0.01		c0.01	c0.05	
v/s Ratio Perm												
v/c Ratio	0.56	0.08		0.04	0.33		0.07	0.04		0.51	0.24	
Uniform Delay, d1	14.0	8.9		19.6	15.7		19.5	12.4		19.5	12.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.1		0.8	0.8		1.2	0.0		12.2	0.2	
Delay (s)	16.1	9.0		20.3	16.5		20.7	12.4		31.7	12.9	
Level of Service	B	A		C	B		C	B		C	B	
Approach Delay (s)		14.6			16.5			12.9			13.8	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			40.3			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			36.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
11: Locust Ave & Base Line Rd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	228	64	23	248	3	88	0	37	3	1	3
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00		1.00	1.00	1.00	1.00
Flt Protected	1.00	0.97		1.00	1.00		1.00		0.85	1.00	1.00	0.85
Flt Permitted	0.95	1.00		0.95	1.00		0.76		1.00	0.76	1.00	1.00
Satd. Flow (prot)	1583	3243		1583	3347		1583		1500	1583	1765	1500
Satd. Flow (perm)	1583	3243		1583	3347		1262		1500	1262	1765	1500
Peak-hour factor, PHF	0.92	0.94	0.94	0.94	0.94	0.92	0.94	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	8	243	68	24	264	3	94	0	39	3	1	3
RTOR Reduction (vph)	0	28	0	0	1	0	0	0	28	0	0	2
Lane Group Flow (vph)	8	283	0	24	266	0	94	0	11	3	1	1
Turn Type	Prot	NA		Prot	NA		Perm		Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)	0.8	8.4		0.9	8.5		8.1		8.1	8.1	8.1	8.1
Effective Green, g (s)	0.8	8.4		0.9	8.5		8.1		8.1	8.1	8.1	8.1
Actuated g/C Ratio	0.03	0.29		0.03	0.29		0.28		0.28	0.28	0.28	0.28
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)	43	926		48	967		347		413	347	486	413
v/s Ratio Prot	0.01	c0.09		c0.02	0.08						0.00	
v/s Ratio Perm							c0.07		0.01	0.00		0.00
v/c Ratio	0.19	0.31		0.50	0.28		0.27		0.03	0.01	0.00	0.00
Uniform Delay, d1	14.0	8.2		14.0	8.1		8.3		7.8	7.7	7.7	7.7
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.2		8.0	0.2		0.4		0.0	0.0	0.0	0.0
Delay (s)	16.1	8.4		22.0	8.2		8.8		7.8	7.7	7.7	7.7
Level of Service	B	A		C	A		A		A	A	A	A
Approach Delay (s)		8.6			9.4			8.5			7.7	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.30										
Actuated Cycle Length (s)		29.4			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		34.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗↗
Volume (vph)	436	89	111	392	80	150
Ideal Flow (vphpl)	1800	1800	1700	1800	1700	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	0.88
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3268		1583	3353	1583	2640
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3268		1583	3353	1583	2640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	474	97	121	426	87	163
RTOR Reduction (vph)	18	0	0	0	0	139
Lane Group Flow (vph)	553	0	121	426	87	24
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	15.7		6.9	26.6	6.1	6.1
Effective Green, g (s)	15.7		6.9	26.6	6.1	6.1
Actuated g/C Ratio	0.39		0.17	0.65	0.15	0.15
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1260		268	2191	237	395
v/s Ratio Prot	c0.17		c0.08	0.13	c0.05	
v/s Ratio Perm						0.01
v/c Ratio	0.44		0.45	0.19	0.37	0.06
Uniform Delay, d1	9.2		15.2	2.8	15.6	14.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		1.2	0.0	1.0	0.1
Delay (s)	9.5		16.4	2.8	16.5	14.9
Level of Service	A		B	A	B	B
Approach Delay (s)	9.5			5.8	15.5	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			9.1		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.43			
Actuated Cycle Length (s)			40.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			37.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Rialto Impact Fee Study
13: Ayala Dr & Casmalia St

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	49	197	193	36	20	119	388	104	15	639	15
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	
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)	1583	1765	1500	1583	1765	1500	1583	3247		1583	3341	
Flt Permitted	0.73	1.00	1.00	0.72	1.00	1.00	0.30	1.00		0.40	1.00	
Satd. Flow (perm)	1214	1765	1500	1196	1765	1500	492	3247		664	3341	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	9	60	243	238	44	25	147	479	128	19	789	19
RTOR Reduction (vph)	0	0	121	0	0	17	0	28	0	0	2	0
Lane Group Flow (vph)	9	60	122	238	44	8	147	579	0	19	806	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	17.2	17.2	17.2	17.2	17.2	17.2	25.5	25.5		25.5	25.5	
Effective Green, g (s)	17.2	17.2	17.2	17.2	17.2	17.2	25.5	25.5		25.5	25.5	
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34	0.34	0.50	0.50		0.50	0.50	
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)	411	598	508	405	598	508	247	1633		333	1680	
v/s Ratio Prot		0.03			0.02			0.18			0.24	
v/s Ratio Perm	0.01		0.08	c0.20		0.01	c0.30			0.03		
v/c Ratio	0.02	0.10	0.24	0.59	0.07	0.02	0.60	0.35		0.06	0.48	
Uniform Delay, d1	11.2	11.5	12.0	13.8	11.4	11.1	8.9	7.6		6.4	8.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.1	0.2	2.2	0.1	0.0	3.8	0.1		0.1	0.2	
Delay (s)	11.2	11.5	12.3	16.0	11.4	11.1	12.8	7.8		6.5	8.5	
Level of Service	B	B	B	B	B	B	B	A		A	A	
Approach Delay (s)		12.1			14.9			8.7			8.4	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.0									
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			50.7									
Intersection Capacity Utilization			55.1%									
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
14: Ayala Dr & I-210 WB Ramps

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	362	3	206	743	405	0	0	615	414
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.95	
Frt				1.00	0.98	0.85	1.00	1.00			0.94	
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1504	1507	1425	2891	3353			3151	
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1504	1507	1425	2891	3353			3151	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	0	0	426	4	242	874	476	0	0	724	487
RTOR Reduction (vph)	0	0	0	0	7	172	0	0	0	0	131	0
Lane Group Flow (vph)	0	0	0	234	223	36	874	476	0	0	1080	0
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				15.5	15.5	15.5	28.0	65.2			33.2	
Effective Green, g (s)				15.5	15.5	15.5	28.0	65.2			33.2	
Actuated g/C Ratio				0.17	0.17	0.17	0.32	0.74			0.37	
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)				262	263	249	912	2464			1179	
v/s Ratio Prot							c0.30	0.14			c0.34	
v/s Ratio Perm				c0.16	0.15	0.03						
v/c Ratio				0.89	0.85	0.15	0.96	0.19			0.92	
Uniform Delay, d1				35.8	35.5	31.0	29.8	3.6			26.4	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				29.4	21.7	0.3	20.1	0.0			11.1	
Delay (s)				65.2	57.2	31.3	49.9	3.7			37.5	
Level of Service				E	E	C	D	A			D	
Approach Delay (s)		0.0			52.0			33.6			37.5	
Approach LOS		A			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			38.9				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			88.7				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			80.0%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
15: Ayala Dr & I-210 EB Ramps

Existing Conditions
Timing Plan: AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	107	1	321	0	0	0	0	1041	291	320	657	0	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0		
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	0.97	0.95		
Frt	1.00	0.86	0.85					1.00	0.85	1.00	1.00		
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1593	1377	1425					3353	1500	3252	3353		
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00		
Satd. Flow (perm)	1593	1377	1425					3353	1500	3252	3353		
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	
Adj. Flow (vph)	122	1	365	0	0	0	0	1183	331	364	747	0	
RTOR Reduction (vph)	0	149	161	0	0	0	0	0	164	0	0	0	
Lane Group Flow (vph)	110	39	29	0	0	0	0	1183	167	364	747	0	
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA		
Protected Phases		4						2		1	6		
Permitted Phases	4		4						2				
Actuated Green, G (s)	11.1	11.1	11.1					37.1	37.1	13.3	54.4		
Effective Green, g (s)	11.1	11.1	11.1					37.1	37.1	13.3	54.4		
Actuated g/C Ratio	0.15	0.15	0.15					0.50	0.50	0.18	0.74		
Clearance Time (s)	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		
Lane Grp Cap (vph)	240	207	215					1692	757	588	2481		
v/s Ratio Prot								c0.35		c0.11	0.22		
v/s Ratio Perm	c0.07	0.03	0.02						0.11				
v/c Ratio	0.46	0.19	0.13					0.70	0.22	0.62	0.30		
Uniform Delay, d1	28.5	27.3	27.0					13.9	10.1	27.8	3.2		
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00		
Incremental Delay, d2	1.4	0.4	0.3					1.3	0.1	1.9	0.1		
Delay (s)	29.8	27.7	27.3					15.2	10.3	29.7	3.3		
Level of Service	C	C	C					B	B	C	A		
Approach Delay (s)		28.0			0.0			14.1			11.9		
Approach LOS		C			A			B			B		
Intersection Summary													
HCM 2000 Control Delay			15.5									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			73.5									Sum of lost time (s)	12.0
Intersection Capacity Utilization			80.0%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

Rialto Impact Fee Study
16: Ayala Dr & Renaissance Pkwy/Easton St

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	61	160	8	69	322	111	977	13	99	870	9
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	2988		1583	2938		1583	3353	1500	1583	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	2988		1583	2938		1583	3353	1500	1583	3353	1500
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	39	69	182	9	78	366	126	1110	15	112	989	10
RTOR Reduction (vph)	0	146	0	0	260	0	0	0	8	0	0	5
Lane Group Flow (vph)	39	105	0	9	184	0	126	1110	7	112	989	5
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	3.3	14.5		0.6	11.8		9.1	34.2	34.2	8.4	33.5	33.5
Effective Green, g (s)	3.3	14.5		0.6	11.8		9.1	34.2	34.2	8.4	33.5	33.5
Actuated g/C Ratio	0.04	0.20		0.01	0.16		0.12	0.46	0.46	0.11	0.45	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)	70	587		12	470		195	1555	696	180	1524	681
v/s Ratio Prot	c0.02	c0.04		0.01	c0.06		c0.08	c0.33		0.07	0.29	
v/s Ratio Perm									0.00			0.00
v/c Ratio	0.56	0.18		0.75	0.39		0.65	0.71	0.01	0.62	0.65	0.01
Uniform Delay, d1	34.5	24.6		36.5	27.7		30.8	15.8	10.6	31.1	15.6	11.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.3	0.1		128.3	0.5		7.2	1.6	0.0	6.5	1.0	0.0
Delay (s)	43.8	24.8		164.7	28.3		37.9	17.4	10.6	37.7	16.5	11.0
Level of Service	D	C		F	C		D	B	B	D	B	B
Approach Delay (s)		27.3			31.0			19.4			18.6	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			21.5			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			73.7			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			64.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
17: Cedar Ave/Ayala Dr & Base Line Rd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	253	58	61	267	61	26	539	90	41	596	50
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3259		1583	3260		1583	1765	1500	1583	3314	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3259		1583	3260		1583	1765	1500	1583	3314	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	165	288	66	69	303	69	30	612	102	47	677	57
RTOR Reduction (vph)	0	19	0	0	19	0	0	0	51	0	6	0
Lane Group Flow (vph)	165	335	0	69	353	0	30	612	51	47	728	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	13.7	21.7		7.2	15.2		3.4	48.3	48.3	3.8	48.7	
Effective Green, g (s)	13.7	21.7		7.2	15.2		3.4	48.3	48.3	3.8	48.7	
Actuated g/C Ratio	0.14	0.22		0.07	0.16		0.04	0.50	0.50	0.04	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)	223	729		117	510		55	878	746	62	1663	
v/s Ratio Prot	c0.10	0.10		0.04	c0.11		0.02	c0.35		c0.03	0.22	
v/s Ratio Perm									0.03			
v/c Ratio	0.74	0.46		0.59	0.69		0.55	0.70	0.07	0.76	0.44	
Uniform Delay, d1	39.9	32.6		43.5	38.7		46.0	18.7	12.7	46.1	15.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.1	0.5		7.4	4.0		10.6	4.6	0.2	40.5	0.8	
Delay (s)	52.1	33.0		50.9	42.7		56.6	23.3	12.8	86.6	16.3	
Level of Service	D	C		D	D		E	C	B	F	B	
Approach Delay (s)		39.1			44.0			23.2			20.5	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			97.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			65.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
18: Cedar Ave & Foothill Blvd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	380	98	92	423	51	109	475	120	119	736	68
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	4670		1583	4740		1583	3251		1583	3311	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	4670		1583	4740		1583	3251		1583	3311	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	83	427	110	103	475	57	122	534	135	134	827	76
RTOR Reduction (vph)	0	46	0	0	15	0	0	21	0	0	6	0
Lane Group Flow (vph)	83	491	0	103	517	0	122	648	0	134	897	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.7	14.2		8.8	15.3		9.9	41.0		12.5	43.6	
Effective Green, g (s)	7.7	14.2		8.8	15.3		9.9	41.0		12.5	43.6	
Actuated g/C Ratio	0.08	0.15		0.10	0.17		0.11	0.44		0.14	0.47	
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)	131	716		150	784		169	1440		213	1560	
v/s Ratio Prot	0.05	0.11		c0.07	c0.11		0.08	0.20		c0.08	c0.27	
v/s Ratio Perm												
v/c Ratio	0.63	0.69		0.69	0.66		0.72	0.45		0.63	0.58	
Uniform Delay, d1	41.0	37.0		40.5	36.2		40.0	17.9		37.8	17.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.6	2.7		12.3	2.0		14.1	1.0		5.7	1.5	
Delay (s)	50.6	39.8		52.8	38.2		54.1	18.9		43.5	19.3	
Level of Service	D	D		D	D		D	B		D	B	
Approach Delay (s)		41.2			40.5			24.4			22.4	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			92.5			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			59.6%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
19: Cedar Ave & Rialto Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	167	196	156	214	285	131	526	154	204	712	83
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.91		1.00	0.97		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)	1583	3081		1583	3066		1583	3239		1583	3300	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3081		1583	3066		1583	3239		1583	3300	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	61	196	231	184	252	335	154	619	181	240	838	98
RTOR Reduction (vph)	0	197	0	0	238	0	0	27	0	0	9	0
Lane Group Flow (vph)	61	230	0	184	349	0	154	773	0	240	927	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.7	12.6		14.0	19.9		12.4	26.2		17.4	31.2	
Effective Green, g (s)	6.7	12.6		14.0	19.9		12.4	26.2		17.4	31.2	
Actuated g/C Ratio	0.08	0.15		0.16	0.23		0.14	0.30		0.20	0.36	
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)	123	450		257	707		227	984		319	1194	
v/s Ratio Prot	0.04	0.07		c0.12	c0.11		0.10	0.24		c0.15	c0.28	
v/s Ratio Perm												
v/c Ratio	0.50	0.51		0.72	0.49		0.68	0.79		0.75	0.78	
Uniform Delay, d1	38.1	34.0		34.2	28.8		35.0	27.4		32.4	24.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	1.0		9.1	0.5		7.8	4.2		9.6	3.2	
Delay (s)	41.3	34.9		43.3	29.3		42.8	31.6		42.0	27.6	
Level of Service	D	C		D	C		D	C		D	C	
Approach Delay (s)		35.7			32.7			33.4			30.6	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			32.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			86.2			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			67.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
20: Cedar Ave & Merrill Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	224	156	124	744	101	92	182	65	56	596	27
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.98		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3147		1583	3293		1583	3221		1583	3331	
Flt Permitted	0.18	1.00		0.47	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	305	3147		786	3293		1583	3221		1583	3331	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	68	249	173	138	827	112	102	202	72	62	662	30
RTOR Reduction (vph)	0	101	0	0	12	0	0	34	0	0	3	0
Lane Group Flow (vph)	68	321	0	138	927	0	102	240	0	62	689	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	30.8	30.8		30.8	30.8		7.7	26.3		4.7	23.3	
Effective Green, g (s)	30.8	30.8		30.8	30.8		7.7	26.3		4.7	23.3	
Actuated g/C Ratio	0.42	0.42		0.42	0.42		0.10	0.36		0.06	0.32	
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)	127	1313		328	1374		165	1147		100	1051	
v/s Ratio Prot		0.10			c0.28		c0.06	c0.07		0.04	c0.21	
v/s Ratio Perm	0.22			0.18								
v/c Ratio	0.54	0.24		0.42	0.67		0.62	0.21		0.62	0.66	
Uniform Delay, d1	16.1	14.0		15.2	17.4		31.6	16.5		33.7	21.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	0.1		0.9	1.3		6.7	0.1		10.9	1.5	
Delay (s)	20.4	14.0		16.1	18.8		38.4	16.6		44.6	23.3	
Level of Service	C	B		B	B		D	B		D	C	
Approach Delay (s)		14.9			18.4			22.5			25.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			20.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			73.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			66.2%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
21: Cedar Ave & Randall Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	92	56	66	92	42	32	638	24	64	824	39
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1665		1583	1765	1500	1583	3335		1583	3330	
Flt Permitted	0.69	1.00		0.66	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1157	1665		1097	1765	1500	1583	3335		1583	3330	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	97	59	69	97	44	34	672	25	67	867	41
RTOR Reduction (vph)	0	24	0	0	0	37	0	3	0	0	3	0
Lane Group Flow (vph)	42	132	0	69	97	7	34	694	0	67	905	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	7.8	7.8		7.8	7.8	7.8	2.3	22.7		4.3	24.7	
Effective Green, g (s)	7.8	7.8		7.8	7.8	7.8	2.3	22.7		4.3	24.7	
Actuated g/C Ratio	0.17	0.17		0.17	0.17	0.17	0.05	0.49		0.09	0.53	
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)	192	277		182	294	250	77	1617		145	1757	
v/s Ratio Prot		c0.08			0.05		0.02	0.21		c0.04	c0.27	
v/s Ratio Perm	0.04			0.06		0.00						
v/c Ratio	0.22	0.48		0.38	0.33	0.03	0.44	0.43		0.46	0.51	
Uniform Delay, d1	16.9	17.7		17.3	17.2	16.3	21.6	7.8		20.2	7.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	1.3		1.3	0.7	0.0	4.0	0.2		2.3	0.3	
Delay (s)	17.4	18.9		18.7	17.9	16.4	25.6	8.0		22.5	7.4	
Level of Service	B	B		B	B	B	C	A		C	A	
Approach Delay (s)		18.6			17.8			8.8			8.5	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.5		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			46.8		Sum of lost time (s)					12.0		
Intersection Capacity Utilization			54.8%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
22: Cactus Ave/Country Club Dr & Riverside Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	311	9	35	43	12	8	475	89	76	36	106
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frt	1.00	1.00		1.00	0.97		1.00	0.98			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1583	3338		1583	3244		1583	1723			3055	
Flt Permitted	0.95	1.00		0.95	1.00		0.60	1.00			0.68	
Satd. Flow (perm)	1583	3338		1583	3244		1007	1723			2111	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	338	10	38	47	13	9	516	97	83	39	115
RTOR Reduction (vph)	0	2	0	0	11	0	0	8	0	0	59	0
Lane Group Flow (vph)	105	346	0	38	49	0	9	605	0	0	178	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	8.2	13.9		2.0	7.7		26.3	26.3			26.3	
Effective Green, g (s)	8.2	13.9		2.0	7.7		26.3	26.3			26.3	
Actuated g/C Ratio	0.15	0.26		0.04	0.14		0.49	0.49			0.49	
Clearance Time (s)	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	
Lane Grp Cap (vph)	239	856		58	460		488	836			1024	
v/s Ratio Prot	c0.07	c0.10		0.02	0.02			c0.35				
v/s Ratio Perm							0.01				0.08	
v/c Ratio	0.44	0.40		0.66	0.11		0.02	0.72			0.17	
Uniform Delay, d1	20.9	16.7		25.8	20.3		7.2	11.1			7.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	1.3	0.3		23.6	0.1		0.0	3.1			0.1	
Delay (s)	22.2	17.0		49.3	20.4		7.3	14.2			7.9	
Level of Service	C	B		D	C		A	B			A	
Approach Delay (s)		18.2			31.6			14.1			7.9	
Approach LOS		B			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			54.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			65.1%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
23: Cactus Ave & Casmalia St

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	16	38	144	16	22	15	202	305	22	11	376	40
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	18	42	158	18	24	16	222	335	24	12	413	44
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	218	58	390	192	219	251						
Volume Left (vph)	18	18	222	0	12	0						
Volume Right (vph)	158	16	0	24	0	44						
Hadj (s)	-0.39	-0.08	0.32	-0.05	0.06	-0.09						
Departure Headway (s)	6.0	6.8	6.4	6.0	6.3	6.2						
Degree Utilization, x	0.36	0.11	0.69	0.32	0.38	0.43						
Capacity (veh/h)	551	455	545	579	547	562						
Control Delay (s)	12.5	10.7	21.4	10.6	12.0	12.5						
Approach Delay (s)	12.5	10.7	17.8		12.3							
Approach LOS	B	B	C		B							
Intersection Summary												
Delay			14.7									
Level of Service			B									
Intersection Capacity Utilization			51.6%	ICU Level of Service		A						
Analysis Period (min)			15									

Rialto Impact Fee Study
24: Cactus Ave & Easton St

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	59	30	67	38	53	144	152	356	50	117	383	52
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	63	32	72	41	57	155	163	383	54	126	412	56
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	168	253	355	245	332	262						
Volume Left (vph)	63	41	163	0	126	0						
Volume Right (vph)	72	155	0	54	0	56						
Hadj (s)	-0.15	-0.30	0.26	-0.12	0.22	-0.12						
Departure Headway (s)	7.6	7.1	7.5	7.1	7.5	7.1						
Degree Utilization, x	0.35	0.50	0.74	0.48	0.69	0.52						
Capacity (veh/h)	426	474	469	494	464	483						
Control Delay (s)	14.6	16.9	27.5	15.3	24.1	16.3						
Approach Delay (s)	14.6	16.9	22.5		20.7							
Approach LOS	B	C	C		C							
Intersection Summary												
Delay			20.1									
Level of Service			C									
Intersection Capacity Utilization			62.2%	ICU Level of Service				B				
Analysis Period (min)			15									

Rialto Impact Fee Study
25: Cactus Ave & Base Line Rd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	102	549	115	190	559	142	92	428	164	160	495	117
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3266		1583	3251		1583	3214		1583	3257	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3266		1583	3251		1583	3214		1583	3257	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	126	678	142	235	690	175	114	528	202	198	611	144
RTOR Reduction (vph)	0	18	0	0	23	0	0	39	0	0	20	0
Lane Group Flow (vph)	126	802	0	235	842	0	114	691	0	198	735	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.4	25.8		17.1	32.5		9.6	25.2		14.4	30.0	
Effective Green, g (s)	10.4	25.8		17.1	32.5		9.6	25.2		14.4	30.0	
Actuated g/C Ratio	0.11	0.26		0.17	0.33		0.10	0.26		0.15	0.30	
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)	167	855		274	1072		154	822		231	991	
v/s Ratio Prot	0.08	c0.25		c0.15	0.26		0.07	c0.21		c0.13	0.23	
v/s Ratio Perm												
v/c Ratio	0.75	0.94		0.86	0.79		0.74	0.84		0.86	0.74	
Uniform Delay, d1	42.8	35.6		39.5	29.8		43.2	34.7		41.0	30.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.4	17.5		22.3	3.9		17.3	10.1		25.5	5.0	
Delay (s)	60.3	53.0		61.8	33.7		60.5	44.8		66.5	35.8	
Level of Service	E	D		E	C		E	D		E	D	
Approach Delay (s)		54.0			39.7			47.0			42.1	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			45.4			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			98.5			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			72.9%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
26: Cactus Ave & Foothill Blvd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	567	65	108	508	51	48	251	80	79	472	48
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.91		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	4743		1583	3353	1500	1583	3231		1583	3306	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.37	1.00		0.51	1.00	
Satd. Flow (perm)	1583	4743		1583	3353	1500	617	3231		846	3306	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	39	644	74	123	577	58	55	285	91	90	536	55
RTOR Reduction (vph)	0	15	0	0	0	39	0	27	0	0	7	0
Lane Group Flow (vph)	39	703	0	123	577	19	55	349	0	90	584	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	5.0	21.1		11.8	27.9	27.9	39.4	39.4		39.4	39.4	
Effective Green, g (s)	5.0	21.1		11.8	27.9	27.9	39.4	39.4		39.4	39.4	
Actuated g/C Ratio	0.06	0.25		0.14	0.33	0.33	0.47	0.47		0.47	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)	93	1187		221	1109	496	288	1510		395	1545	
v/s Ratio Prot	0.02	c0.15		c0.08	0.17			0.11			c0.18	
v/s Ratio Perm						0.01	0.09			0.11		
v/c Ratio	0.42	0.59		0.56	0.52	0.04	0.19	0.23		0.23	0.38	
Uniform Delay, d1	38.2	27.8		33.8	22.8	19.1	13.1	13.4		13.4	14.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	0.8		3.0	0.4	0.0	1.5	0.4		1.3	0.7	
Delay (s)	41.3	28.6		36.8	23.2	19.1	14.6	13.8		14.7	15.2	
Level of Service	D	C		D	C	B	B	B		B	B	
Approach Delay (s)		29.3			25.1			13.9			15.2	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			21.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			84.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			51.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
27: Cactus Ave & Rialto Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	260	108	31	359	57	130	251	24	76	457	364
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3205		1583	3284		1583	3309		1583	3130	
Flt Permitted	0.38	1.00		0.43	1.00		0.22	1.00		0.55	1.00	
Satd. Flow (perm)	637	3205		716	3284		374	3309		916	3130	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	117	317	132	38	438	70	159	306	29	93	557	444
RTOR Reduction (vph)	0	45	0	0	13	0	0	8	0	0	75	0
Lane Group Flow (vph)	117	404	0	38	495	0	159	327	0	93	926	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.4	20.4		20.4	20.4		35.7	35.7		35.7	35.7	
Effective Green, g (s)	20.4	20.4		20.4	20.4		35.7	35.7		35.7	35.7	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.56	0.56		0.56	0.56	
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)	202	1020		227	1045		208	1842		510	1743	
v/s Ratio Prot		0.13			0.15			0.10			0.30	
v/s Ratio Perm	c0.18			0.05			c0.43			0.10		
v/c Ratio	0.58	0.40		0.17	0.47		0.76	0.18		0.18	0.53	
Uniform Delay, d1	18.3	17.0		15.7	17.5		11.0	7.0		7.0	8.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.0	0.3		0.4	0.3		15.3	0.0		0.2	0.3	
Delay (s)	22.3	17.3		16.1	17.9		26.3	7.0		7.2	9.2	
Level of Service	C	B		B	B		C	A		A	A	
Approach Delay (s)		18.3			17.8			13.2			9.1	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			13.5				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			64.1				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			65.4%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
28: Cactus Ave & Merrill Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	72	233	29	33	235	76	27	297	38	64	450	71
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		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)	1583	3297		1583	3231		1583	3296		1583	3284	
Flt Permitted	0.53	1.00		0.56	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	886	3297		937	3231		1583	3296		1583	3284	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	86	277	35	39	280	90	32	354	45	76	536	85
RTOR Reduction (vph)	0	11	0	0	34	0	0	11	0	0	14	0
Lane Group Flow (vph)	86	301	0	39	336	0	32	388	0	76	607	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	12.0	12.0		12.0	12.0		2.3	14.5		4.5	16.7	
Effective Green, g (s)	12.0	12.0		12.0	12.0		2.3	14.5		4.5	16.7	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.05	0.34		0.10	0.39	
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)	247	920		261	901		84	1111		165	1275	
v/s Ratio Prot		0.09			c0.10		0.02	0.12		c0.05	c0.18	
v/s Ratio Perm	0.10			0.04								
v/c Ratio	0.35	0.33		0.15	0.37		0.38	0.35		0.46	0.48	
Uniform Delay, d1	12.4	12.3		11.7	12.5		19.7	10.7		18.1	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.2		0.3	0.3		2.9	0.2		2.0	0.3	
Delay (s)	13.2	12.5		11.9	12.7		22.5	10.9		20.1	10.1	
Level of Service	B	B		B	B		C	B		C	B	
Approach Delay (s)		12.7			12.7			11.8			11.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			11.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			43.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			46.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
29: Cactus Ave & Randall Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	127	62	13	105	55	40	211	31	90	411	23
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1678		1583	1674		1583	3288		1583	3327	
Flt Permitted	0.51	1.00		0.43	1.00		0.46	1.00		0.58	1.00	
Satd. Flow (perm)	851	1678		716	1674		769	3288		959	3327	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	38	151	74	15	125	65	48	251	37	107	489	27
RTOR Reduction (vph)	0	26	0	0	27	0	0	7	0	0	2	0
Lane Group Flow (vph)	38	199	0	15	163	0	48	281	0	107	514	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.3	13.3		13.3	13.3		48.4	48.4		48.4	48.4	
Effective Green, g (s)	13.3	13.3		13.3	13.3		48.4	48.4		48.4	48.4	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.69	0.69		0.69	0.69	
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)	162	320		136	319		533	2283		665	2310	
v/s Ratio Prot		c0.12			0.10			0.09			c0.15	
v/s Ratio Perm	0.04			0.02			0.06			0.11		
v/c Ratio	0.23	0.62		0.11	0.51		0.09	0.12		0.16	0.22	
Uniform Delay, d1	23.9	25.9		23.3	25.3		3.5	3.6		3.7	3.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	3.7		0.4	1.4		0.3	0.1		0.5	0.2	
Delay (s)	24.6	29.6		23.7	26.7		3.8	3.7		4.2	4.1	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		28.9			26.5			3.7			4.1	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			69.7				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			43.8%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
30: Cactus Ave & San Bernardino Ave/San Bernardino Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	46	122	7	85	246	2	27	146	67	7	174	57
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	68	179	10	125	362	3	40	215	99	10	256	84
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	157	100	306	184	40	313	10	340				
Volume Left (vph)	68	0	125	0	40	0	10	0				
Volume Right (vph)	0	10	0	3	0	99	0	84				
Hadj (s)	0.25	-0.04	0.24	0.02	0.53	-0.19	0.53	-0.14				
Departure Headway (s)	8.1	7.8	7.6	7.4	8.1	7.4	8.1	7.4				
Degree Utilization, x	0.35	0.22	0.65	0.38	0.09	0.64	0.02	0.70				
Capacity (veh/h)	419	432	458	468	425	467	425	468				
Control Delay (s)	14.2	11.7	22.3	13.6	10.7	21.3	10.0	24.4				
Approach Delay (s)	13.2		19.1		20.1		24.0					
Approach LOS	B		C		C		C					
Intersection Summary												
Delay			19.5									
Level of Service			C									
Intersection Capacity Utilization			45.0%		ICU Level of Service		A					
Analysis Period (min)			15									

Rialto Impact Fee Study
31: Cactus Ave & Valley Blvd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	87	324	0	2	466	168	0	0	1	244	0	116
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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		1.00
Flt Protected	1.00	1.00		1.00	1.00	0.85		0.85		1.00		0.85
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		0.95		1.00
Satd. Flow (prot)	1583	3353		1583	1765	1500		1500		1583		1500
Satd. Flow (perm)	445	3353		836	1765	1500		1500		1262		1500
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	113	421	0	3	605	218	0	0	1	317	0	151
RTOR Reduction (vph)	0	0	0	0	0	94	0	1	0	0	0	94
Lane Group Flow (vph)	113	421	0	3	605	124	0	0	0	317	0	57
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	29.4	29.4		29.4	29.4	29.4		22.4		22.4		22.4
Effective Green, g (s)	29.4	29.4		29.4	29.4	29.4		22.4		22.4		22.4
Actuated g/C Ratio	0.49	0.49		0.49	0.49	0.49		0.37		0.37		0.37
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)	218	1648		411	867	737		561		472		561
v/s Ratio Prot		0.13			c0.34			0.00				
v/s Ratio Perm	0.25			0.00		0.08				c0.25		0.04
v/c Ratio	0.52	0.26		0.01	0.70	0.17		0.00		0.67		0.10
Uniform Delay, d1	10.4	8.8		7.8	11.8	8.4		11.7		15.6		12.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00		1.00
Incremental Delay, d2	2.1	0.1		0.0	2.5	0.1		0.0		3.7		0.1
Delay (s)	12.4	8.9		7.8	14.2	8.5		11.7		19.4		12.2
Level of Service	B	A		A	B	A		B		B		B
Approach Delay (s)		9.7			12.7			11.7			17.1	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			59.8				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			63.1%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
32: Riverside Ave & I-210 WB Ramps

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	649	3	319	879	565	0	0	971	246
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.86	1.00
Frt				1.00	0.99	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1504	1515	1425	2891	3353			6071	1500
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1504	1515	1425	2891	3353			6071	1500
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	683	3	336	925	595	0	0	1022	259
RTOR Reduction (vph)	0	0	0	0	4	215	0	0	0	0	0	204
Lane Group Flow (vph)	0	0	0	362	354	87	925	595	0	0	1022	55
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				24.5	24.5	24.5	30.3	52.3			18.0	18.0
Effective Green, g (s)				24.5	24.5	24.5	30.3	52.3			18.0	18.0
Actuated g/C Ratio				0.29	0.29	0.29	0.36	0.62			0.21	0.21
Clearance Time (s)				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
Lane Grp Cap (vph)				434	437	411	1032	2067			1288	318
v/s Ratio Prot							c0.32	0.18			c0.17	
v/s Ratio Perm				c0.24	0.23	0.06						0.04
v/c Ratio				0.83	0.81	0.21	0.90	0.29			0.79	0.17
Uniform Delay, d1				28.2	28.0	22.8	25.8	7.6			31.6	27.3
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				12.9	10.6	0.3	10.2	0.1			3.4	0.3
Delay (s)				41.2	38.6	23.1	36.0	7.6			35.1	27.6
Level of Service				D	D	C	D	A			D	C
Approach Delay (s)		0.0			34.9			24.9			33.6	
Approach LOS		A			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.5									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			84.8								12.0	
Intersection Capacity Utilization			85.5%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
33: Riverside Ave & I-210 EB Ramps

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  		 	 	
Volume (vph)	142	1	481	0	0	0	0	1302	433	485	1135	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1600	1800	1800
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95					0.86	1.00	0.97	0.95	
Frt	1.00	0.85	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1426	1425					6071	1500	2891	3353	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1426	1425					6071	1500	2891	3353	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	1	506	0	0	0	0	1371	456	511	1195	0
RTOR Reduction (vph)	0	85	85	0	0	0	0	0	271	0	0	0
Lane Group Flow (vph)	149	169	168	0	0	0	0	1371	185	511	1195	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	14.8	14.8	14.8					31.0	31.0	18.6	53.6	
Effective Green, g (s)	14.8	14.8	14.8					31.0	31.0	18.6	53.6	
Actuated g/C Ratio	0.19	0.19	0.19					0.41	0.41	0.24	0.70	
Clearance Time (s)	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	
Lane Grp Cap (vph)	306	276	276					2463	608	703	2352	
v/s Ratio Prot		c0.12						c0.23		c0.18	0.36	
v/s Ratio Perm	0.09		0.12						0.12			
v/c Ratio	0.49	0.61	0.61					0.56	0.30	0.73	0.51	
Uniform Delay, d1	27.4	28.2	28.2					17.4	15.4	26.6	5.3	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	4.0	3.8					0.3	0.3	3.8	0.2	
Delay (s)	28.6	32.2	32.0					17.7	15.7	30.3	5.5	
Level of Service	C	C	C					B	B	C	A	
Approach Delay (s)		31.3			0.0			17.2			12.9	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.7		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			76.4		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			85.5%		ICU Level of Service				E			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
34: Riverside Ave & Easton St

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	390	83	67	75	80	342	59	1003	76	211	1165	240
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.91		0.97	0.95	1.00
Frt	1.00	0.93		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	1647		1583	1765	1500	1583	4767		2891	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1583	1647		1583	1765	1500	1583	4767		2891	3353	1500
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	415	88	71	80	85	364	63	1067	81	224	1239	255
RTOR Reduction (vph)	0	28	0	0	0	155	0	9	0	0	0	110
Lane Group Flow (vph)	415	131	0	80	85	209	63	1139	0	224	1239	145
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	26.0	33.9		8.1	16.0	16.0	4.0	32.1		9.9	38.0	38.0
Effective Green, g (s)	26.0	33.9		8.1	16.0	16.0	4.0	32.1		9.9	38.0	38.0
Actuated g/C Ratio	0.26	0.34		0.08	0.16	0.16	0.04	0.32		0.10	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
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)	411	558		128	282	240	63	1530		286	1274	570
v/s Ratio Prot	c0.26	0.08		0.05	0.05		0.04	0.24		c0.08	c0.37	
v/s Ratio Perm						c0.14						0.10
v/c Ratio	1.01	0.24		0.62	0.30	0.87	1.00	0.74		0.78	0.97	0.25
Uniform Delay, d1	37.0	23.7		44.5	37.1	41.0	48.0	30.3		44.0	30.5	21.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	46.9	0.2		9.2	0.6	26.6	113.4	2.0		13.1	18.9	0.2
Delay (s)	83.9	24.0		53.6	37.7	67.6	161.4	32.3		57.1	49.3	21.5
Level of Service	F	C		D	D	E	F	C		E	D	C
Approach Delay (s)		67.3			60.7			39.0			46.2	
Approach LOS		E			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			48.9			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			79.6%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
35: Riverside Ave & Base Line Rd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	550	68	55	604	115	131	426	25	243	681	51
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3298		1583	4702		1583	3325		1583	3318	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3298		1583	4702		1583	3325		1583	3318	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	99	640	79	64	702	134	152	495	29	283	792	59
RTOR Reduction (vph)	0	10	0	0	28	0	0	4	0	0	5	0
Lane Group Flow (vph)	99	709	0	64	808	0	152	520	0	283	846	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.0	24.1		6.0	22.1		12.9	27.7		20.8	35.6	
Effective Green, g (s)	8.0	24.1		6.0	22.1		12.9	27.7		20.8	35.6	
Actuated g/C Ratio	0.08	0.25		0.06	0.23		0.14	0.29		0.22	0.38	
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)	133	840		100	1098		215	973		348	1248	
v/s Ratio Prot	c0.06	c0.22		0.04	0.17		0.10	0.16		c0.18	c0.25	
v/s Ratio Perm												
v/c Ratio	0.74	0.84		0.64	0.74		0.71	0.53		0.81	0.68	
Uniform Delay, d1	42.3	33.5		43.2	33.6		39.0	28.0		35.1	24.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.0	7.8		13.1	2.6		10.1	2.1		13.5	3.0	
Delay (s)	62.3	41.3		56.4	36.2		49.2	30.1		48.6	27.7	
Level of Service	E	D		E	D		D	C		D	C	
Approach Delay (s)		43.8			37.6			34.4			32.9	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			36.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			94.6			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			64.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
36: Riverside Ave & Foothill Blvd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	630	74	100	545	116	122	292	81	181	480	100
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	4741		1583	4691		1583	3353	1500	1583	3266	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	4741		1583	4691		1583	3353	1500	1583	3266	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	102	677	80	108	586	125	131	314	87	195	516	108
RTOR Reduction (vph)	0	14	0	0	32	0	0	0	66	0	18	0
Lane Group Flow (vph)	102	743	0	108	679	0	131	314	21	195	606	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	8.1	18.8		8.4	19.1		9.4	19.0	19.0	15.2	24.8	
Effective Green, g (s)	8.1	18.8		8.4	19.1		9.4	19.0	19.0	15.2	24.8	
Actuated g/C Ratio	0.10	0.24		0.11	0.25		0.12	0.25	0.25	0.20	0.32	
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)	165	1151		171	1157		192	823	368	310	1046	
v/s Ratio Prot	0.06	c0.16		c0.07	0.14		0.08	0.09		c0.12	c0.19	
v/s Ratio Perm									0.01			
v/c Ratio	0.62	0.65		0.63	0.59		0.68	0.38	0.06	0.63	0.58	
Uniform Delay, d1	33.2	26.3		33.0	25.7		32.6	24.3	22.4	28.5	21.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.7	1.3		7.4	0.8		9.6	0.3	0.1	4.0	0.8	
Delay (s)	39.9	27.6		40.4	26.4		42.2	24.6	22.4	32.5	22.7	
Level of Service	D	C		D	C		D	C	C	C	C	
Approach Delay (s)		29.0			28.3			28.6			25.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.7			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			77.4			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			59.0%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
37: Riverside Ave & Rialto Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	93	39	79	86	3	52	446	39	14	572	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.99	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1754	1500		1723	1500	1583	3313		1583	3340	
Flt Permitted		0.99	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1754	1500		1723	1500	1583	3313		1583	3340	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	15	106	44	90	98	3	59	507	44	16	650	17
RTOR Reduction (vph)	0	0	38	0	0	3	0	5	0	0	2	0
Lane Group Flow (vph)	0	121	6	0	188	0	59	546	0	16	665	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		11.3	11.3		14.5	14.5	6.9	45.2		1.4	39.7	
Effective Green, g (s)		11.3	11.3		14.5	14.5	6.9	45.2		1.4	39.7	
Actuated g/C Ratio		0.13	0.13		0.16	0.16	0.08	0.51		0.02	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)		224	191		282	246	123	1693		25	1499	
v/s Ratio Prot		c0.07			c0.11		c0.04	0.16		0.01	c0.20	
v/s Ratio Perm			0.00			0.00						
v/c Ratio		0.54	0.03		0.67	0.00	0.48	0.32		0.64	0.44	
Uniform Delay, d1		36.1	33.7		34.7	30.9	39.0	12.6		43.2	16.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.6	0.1		5.8	0.0	2.9	0.5		44.6	1.0	
Delay (s)		38.8	33.8		40.5	30.9	42.0	13.1		87.8	17.7	
Level of Service		D	C		D	C	D	B		F	B	
Approach Delay (s)		37.4			40.4			15.9			19.4	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.3									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			88.4								16.0	
Intersection Capacity Utilization			46.6%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

Existing Conditions

38: Bloomington Ave & Riverside Ave & Merrill Ave

Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	37	260	70	14	52	62	297	61	4	83	441	36
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0				4.0	4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95				1.00	0.95			1.00	0.95	
Frt	1.00	0.96				1.00	0.97			1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00			0.95	1.00	
Satd. Flow (prot)	1583	3231				1676	3267			1676	3315	
Flt Permitted	0.40	1.00				0.41	1.00			0.95	1.00	
Satd. Flow (perm)	663	3231				729	3267			1676	3315	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	43	299	80	16	60	71	341	70	5	95	507	41
RTOR Reduction (vph)	0	3	0	0	0	0	16	0	0	0	5	0
Lane Group Flow (vph)	43	392	0	0	0	131	395	0	0	100	543	0
Turn Type	Perm	NA			Perm	Perm	NA		Prot	Prot	NA	
Protected Phases		4					8		5	5	2	
Permitted Phases	4				8	8						
Actuated Green, G (s)	22.9	22.9				22.9	22.9			8.6	30.2	
Effective Green, g (s)	22.9	22.9				22.9	22.9			8.6	30.2	
Actuated g/C Ratio	0.26	0.26				0.26	0.26			0.10	0.34	
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)	170	828				186	837			161	1121	
v/s Ratio Prot		0.12					0.12			c0.06	0.16	
v/s Ratio Perm	0.06					c0.18						
v/c Ratio	0.25	0.47				0.70	0.47			0.62	0.48	
Uniform Delay, d1	26.4	28.1				30.1	28.1			38.8	23.4	
Progression Factor	1.00	1.00				1.00	1.00			1.00	1.00	
Incremental Delay, d2	0.8	0.4				11.5	0.4			7.2	0.3	
Delay (s)	27.2	28.5				41.6	28.5			46.0	23.7	
Level of Service	C	C				D	C			D	C	
Approach Delay (s)		28.4					31.7				27.2	
Approach LOS		C					C				C	
Intersection Summary												
HCM 2000 Control Delay			30.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			89.3			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			65.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
39: Riverside Ave & Randall Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	121	72	149	161	57	58	499	115	25	655	56
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Flt Protected	1.00	0.94		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1666		1583	1696		1583	3259		1583	3313	
Satd. Flow (perm)	1583	1666		1583	1696		1583	3259		1583	3313	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	41	134	80	166	179	63	64	554	128	28	728	62
RTOR Reduction (vph)	0	22	0	0	13	0	0	19	0	0	6	0
Lane Group Flow (vph)	41	192	0	166	229	0	64	663	0	28	784	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.6	14.6		16.4	16.4		6.2	31.6		1.9	27.3	
Effective Green, g (s)	14.6	14.6		16.4	16.4		6.2	31.6		1.9	27.3	
Actuated g/C Ratio	0.18	0.18		0.20	0.20		0.08	0.39		0.02	0.34	
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)	287	302		322	345		121	1279		37	1123	
v/s Ratio Prot	0.03	c0.12		0.10	c0.14		c0.04	0.20		0.02	c0.24	
v/s Ratio Perm												
v/c Ratio	0.14	0.64		0.52	0.66		0.53	0.52		0.76	0.70	
Uniform Delay, d1	27.7	30.5		28.5	29.5		35.7	18.6		39.1	23.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	4.3		1.4	4.8		4.1	0.4		59.7	1.9	
Delay (s)	27.9	34.8		29.9	34.3		39.9	19.0		98.8	24.9	
Level of Service	C	C		C	C		D	B		F	C	
Approach Delay (s)		33.7			32.5			20.8			27.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			80.5			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			58.5%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
40: Riverside Ave & San Bernardino Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	141	152	225	121	77	65	441	104	77	659	51
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Flt	1.00	0.92		1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1628		1583	1765	1500	1583	3257		1583	3317	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1628		1583	1765	1500	1583	3257		1583	3317	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	30	147	158	234	126	80	68	459	108	80	686	53
RTOR Reduction (vph)	0	38	0	0	0	47	0	20	0	0	6	0
Lane Group Flow (vph)	30	267	0	234	126	33	68	547	0	80	733	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	3.1	20.7		17.2	34.8	34.8	5.7	23.1		7.1	24.5	
Effective Green, g (s)	3.1	20.7		17.2	34.8	34.8	5.7	23.1		7.1	24.5	
Actuated g/C Ratio	0.04	0.25		0.20	0.41	0.41	0.07	0.27		0.08	0.29	
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)	58	400		323	730	620	107	894		133	966	
v/s Ratio Prot	0.02	c0.16		c0.15	0.07		0.04	0.17		c0.05	c0.22	
v/s Ratio Perm						0.02						
v/c Ratio	0.52	0.67		0.72	0.17	0.05	0.64	0.61		0.60	0.76	
Uniform Delay, d1	39.8	28.6		31.2	15.6	14.8	38.2	26.6		37.1	27.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.6	4.2		7.8	0.1	0.0	11.7	1.2		7.5	3.5	
Delay (s)	47.3	32.7		39.1	15.7	14.8	49.9	27.8		44.6	30.6	
Level of Service	D	C		D	B	B	D	C		D	C	
Approach Delay (s)		34.1			28.0			30.2			32.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			84.1			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			69.9%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
41: Riverside Ave & Valley Blvd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	147	513	235	177	35	373	657	175	56	895	32
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1600	1800	1800	1700	1800	1800
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	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		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)	1583	3353	1500	1583	3353	1500	2891	4666		1583	4793	
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)	1583	3353	1500	1583	3353	1500	2891	4666		1583	4793	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	39	158	552	253	190	38	401	706	188	60	962	34
RTOR Reduction (vph)	0	0	214	0	0	23	0	47	0	0	4	0
Lane Group Flow (vph)	39	158	338	253	190	15	401	847	0	60	992	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.1	25.1	25.1	17.3	38.3	38.3	15.0	34.0		6.7	25.7	
Effective Green, g (s)	4.1	25.1	25.1	17.3	38.3	38.3	15.0	34.0		6.7	25.7	
Actuated g/C Ratio	0.04	0.25	0.25	0.17	0.39	0.39	0.15	0.34		0.07	0.26	
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)	65	849	379	276	1295	579	437	1600		107	1242	
v/s Ratio Prot	0.02	0.05		c0.16	0.06		c0.14	0.18		0.04	c0.21	
v/s Ratio Perm			c0.23			0.01						
v/c Ratio	0.60	0.19	0.89	0.92	0.15	0.03	0.92	0.53		0.56	0.80	
Uniform Delay, d1	46.7	29.0	35.7	40.2	19.8	18.8	41.4	26.1		44.8	34.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.0	0.1	22.3	32.8	0.1	0.0	23.9	0.3		6.6	3.7	
Delay (s)	60.7	29.1	58.0	73.0	19.8	18.9	65.3	26.4		51.3	38.0	
Level of Service	E	C	E	E	B	B	E	C		D	D	
Approach Delay (s)		52.1			47.7			38.5			38.7	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			42.6				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			99.1				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			77.1%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
42: Riverside Ave & I-10 WB Ramps

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	399	2	390	187	815	0	0	1078	565
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor				0.95	0.91	0.95	0.97	0.91			0.86	1.00
Frt				1.00	0.92	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1504	1445	1425	2891	4818			6071	1500
Flt Permitted				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1504	1445	1425	2891	4818			6071	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	434	2	424	203	886	0	0	1172	614
RTOR Reduction (vph)	0	0	0	0	43	107	0	0	0	0	0	349
Lane Group Flow (vph)	0	0	0	299	247	164	203	886	0	0	1172	265
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				23.5	23.5	23.5	10.6	49.5			34.9	34.9
Effective Green, g (s)				23.5	23.5	23.5	10.6	49.5			34.9	34.9
Actuated g/C Ratio				0.29	0.29	0.29	0.13	0.61			0.43	0.43
Clearance Time (s)				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
Lane Grp Cap (vph)				436	419	413	378	2944			2615	646
v/s Ratio Prot							c0.07	0.18			c0.19	
v/s Ratio Perm				c0.20	0.17	0.11						0.18
v/c Ratio				0.69	0.59	0.40	0.54	0.30			0.45	0.41
Uniform Delay, d1				25.5	24.6	23.1	32.9	7.5			16.3	15.9
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				4.4	2.2	0.6	1.5	0.1			0.1	0.4
Delay (s)				29.9	26.9	23.7	34.4	7.6			16.4	16.4
Level of Service				C	C	C	C	A			B	B
Approach Delay (s)		0.0			26.9			12.6			16.4	
Approach LOS		A			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.7									
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			81.0									
Intersection Capacity Utilization			69.2%									
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
43: Riverside Ave & I-10 EB Ramps

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	302	10	376	0	0	0	0	700	302	425	1052	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1600	1800	1800
Total Lost time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor	0.95	0.91	0.95					0.91		0.97	0.95	
Frt	1.00	0.90	0.85					0.95		1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1504	1423	1425					4600		2891	3353	
Flt Permitted	0.95	0.99	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1504	1423	1425					4600		2891	3353	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	332	11	413	0	0	0	0	769	332	467	1156	0
RTOR Reduction (vph)	0	68	68	0	0	0	0	77	0	0	0	0
Lane Group Flow (vph)	262	182	176	0	0	0	0	1024	0	467	1156	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)	20.6	20.6	20.6					26.6		18.3	48.9	
Effective Green, g (s)	20.6	20.6	20.6					26.6		18.3	48.9	
Actuated g/C Ratio	0.27	0.27	0.27					0.34		0.24	0.63	
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)	399	378	378					1578		682	2115	
v/s Ratio Prot								c0.22		c0.16	0.34	
v/s Ratio Perm	c0.17	0.13	0.12									
v/c Ratio	0.66	0.48	0.47					0.65		0.68	0.55	
Uniform Delay, d1	25.3	24.0	23.8					21.5		27.0	8.1	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	3.9	1.0	0.9					0.9		2.9	0.3	
Delay (s)	29.2	24.9	24.8					22.4		29.8	8.3	
Level of Service	C	C	C					C		C	A	
Approach Delay (s)		26.3			0.0			22.4			14.5	
Approach LOS		C			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			19.6									HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			77.5							12.0		
Intersection Capacity Utilization			69.2%									ICU Level of Service C
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
44: Riverside Ave & Slover Ave

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	211	20	40	22	10	14	61	869	9	23	1255	245
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.91		1.00	1.00		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)	1583	3015		1583	3055		1583	3348		1583	3271	
Flt Permitted	0.74	1.00		0.71	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1231	3015		1185	3055		1583	3348		1583	3271	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	237	22	45	25	11	16	69	976	10	26	1410	275
RTOR Reduction (vph)	0	35	0	0	12	0	0	1	0	0	15	0
Lane Group Flow (vph)	237	32	0	25	15	0	69	985	0	26	1670	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	22.7	22.7		22.7	22.7		5.1	59.5		3.2	57.6	
Effective Green, g (s)	22.7	22.7		22.7	22.7		5.1	59.5		3.2	57.6	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.05	0.61		0.03	0.59	
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)	286	702		276	711		82	2045		52	1934	
v/s Ratio Prot		0.01			0.00		c0.04	0.29		0.02	c0.51	
v/s Ratio Perm	c0.19			0.02								
v/c Ratio	0.83	0.05		0.09	0.02		0.84	0.48		0.50	0.86	
Uniform Delay, d1	35.5	29.0		29.3	28.8		45.7	10.4		46.3	16.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.6	0.0		0.1	0.0		50.7	0.2		7.4	4.3	
Delay (s)	53.1	29.0		29.4	28.8		96.4	10.6		53.7	20.9	
Level of Service	D	C		C	C		F	B		D	C	
Approach Delay (s)		47.8			29.1			16.2			21.4	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			22.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			97.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			78.4%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
45: Riverside Ave & Jurupa Ave

Existing Conditions
Timing Plan: AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	40	84	71	846	1074	46
Ideal Flow (vphpl)	1700	1800	1700	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1583	1500	1583	4818	3332	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1583	1500	1583	4818	3332	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	43	89	76	900	1143	49
RTOR Reduction (vph)	0	80	0	0	3	0
Lane Group Flow (vph)	43	9	76	900	1189	0
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	5.6	5.6	4.6	39.7	31.1	
Effective Green, g (s)	5.6	5.6	4.6	39.7	31.1	
Actuated g/C Ratio	0.11	0.11	0.09	0.74	0.58	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	166	157	136	3588	1944	
v/s Ratio Prot	c0.03		c0.05	0.19	c0.36	
v/s Ratio Perm		0.01				
v/c Ratio	0.26	0.06	0.56	0.25	0.61	
Uniform Delay, d1	21.9	21.5	23.4	2.1	7.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	0.2	4.9	0.0	0.6	
Delay (s)	22.8	21.6	28.3	2.2	7.8	
Level of Service	C	C	C	A	A	
Approach Delay (s)	22.0			4.2	7.8	
Approach LOS	C			A	A	

Intersection Summary

HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	53.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Rialto Impact Fee Study
46: Riverside Ave & Agua Mansa Rd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	137	80	66	217	42	133	643	49	37	815	152
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		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)	1583	1765	1500	1583	1765	1500	1583	3317		1583	3353	1500
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)	1583	1765	1500	1583	1765	1500	1583	3317		1583	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	149	87	72	236	46	145	699	53	40	886	165
RTOR Reduction (vph)	0	0	66	0	0	37	0	5	0	0	0	91
Lane Group Flow (vph)	139	149	21	72	236	9	145	747	0	40	886	74
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	11.9	22.1	22.1	7.0	17.2	17.2	12.4	40.9		3.7	32.2	32.2
Effective Green, g (s)	11.9	22.1	22.1	7.0	17.2	17.2	12.4	40.9		3.7	32.2	32.2
Actuated g/C Ratio	0.13	0.25	0.25	0.08	0.19	0.19	0.14	0.46		0.04	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	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)	210	434	369	123	338	287	218	1512		65	1203	538
v/s Ratio Prot	c0.09	0.08		0.05	c0.13		c0.09	0.23		0.03	c0.26	
v/s Ratio Perm			0.01			0.01						0.05
v/c Ratio	0.66	0.34	0.06	0.59	0.70	0.03	0.67	0.49		0.62	0.74	0.14
Uniform Delay, d1	37.0	27.8	25.8	39.9	33.8	29.5	36.7	17.1		42.3	25.1	19.4
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	7.6	0.5	0.1	6.9	6.2	0.0	7.4	0.3		16.1	2.4	0.1
Delay (s)	44.6	28.3	25.9	46.9	40.0	29.5	44.1	17.4		58.4	27.4	19.5
Level of Service	D	C	C	D	D	C	D	B		E	C	B
Approach Delay (s)		33.8			40.0			21.7			27.4	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.0									
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			89.7									
Intersection Capacity Utilization			65.3%									
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
47: Acacia Ave & Base Line Rd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	278	18	11	315	10	14	41	10	23	32	24
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.98			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1583	3322		1583	3338			1709			1668	
Flt Permitted	0.56	1.00		0.56	1.00			1.00			1.00	
Satd. Flow (perm)	939	3322		939	3338			1728			1693	
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	10	335	22	13	380	12	17	49	12	28	39	29
RTOR Reduction (vph)	0	6	0	0	2	0	0	10	0	0	24	0
Lane Group Flow (vph)	10	351	0	13	390	0	0	68	0	0	72	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.1	7.1		7.1	7.1			2.0			2.0	
Effective Green, g (s)	7.1	7.1		7.1	7.1			2.0			2.0	
Actuated g/C Ratio	0.42	0.42		0.42	0.42			0.12			0.12	
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)	389	1379		389	1385			202			198	
v/s Ratio Prot		0.11			c0.12							
v/s Ratio Perm	0.01			0.01				0.04			c0.04	
v/c Ratio	0.03	0.25		0.03	0.28			0.34			0.36	
Uniform Delay, d1	3.0	3.3		3.0	3.3			6.9			7.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.1		0.0	0.1			1.0			1.1	
Delay (s)	3.0	3.4		3.0	3.4			7.9			8.1	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		3.4			3.4			7.9			8.1	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			4.2			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			17.1			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			23.9%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
48: Acacia Ave & Foothill Blvd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	753	68	23	641	29	60	122	45	43	128	55
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1583	4758		1583	3331			1695			1691	
Flt Permitted	0.95	1.00		0.95	1.00			0.88			0.92	
Satd. Flow (perm)	1583	4758		1583	3331			1514			1562	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	37	846	76	26	720	33	67	137	51	48	144	62
RTOR Reduction (vph)	0	11	0	0	3	0	0	10	0	0	13	0
Lane Group Flow (vph)	37	911	0	26	750	0	0	245	0	0	241	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	2.3	19.8		2.1	19.6			15.2			15.2	
Effective Green, g (s)	2.3	19.8		2.1	19.6			15.2			15.2	
Actuated g/C Ratio	0.05	0.40		0.04	0.40			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)	74	1918		67	1329			468			483	
v/s Ratio Prot	c0.02	0.19		0.02	c0.23							
v/s Ratio Perm								c0.16			0.15	
v/c Ratio	0.50	0.48		0.39	0.56			0.52			0.50	
Uniform Delay, d1	22.8	10.8		22.9	11.4			14.0			13.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	5.2	0.2		3.7	0.6			1.1			0.8	
Delay (s)	28.1	11.0		26.6	12.0			15.0			14.7	
Level of Service	C	B		C	B			B			B	
Approach Delay (s)		11.7			12.5			15.0			14.7	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			49.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			53.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
49: Pepper Ave & Base Line Rd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	289	186	90	343	41	181	84	51	30	81	16
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.98		1.00	0.94		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)	1583	3156		1583	3299		1583	3163		1583	3272	
Flt Permitted	0.40	1.00		0.30	1.00		0.69	1.00		0.66	1.00	
Satd. Flow (perm)	660	3156		502	3299		1143	3163		1099	3272	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	314	202	98	373	45	197	91	55	33	88	17
RTOR Reduction (vph)	0	145	0	0	13	0	0	19	0	0	6	0
Lane Group Flow (vph)	13	371	0	98	405	0	197	127	0	33	99	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.8	16.8		16.8	16.8		47.3	47.3		47.3	47.3	
Effective Green, g (s)	16.8	16.8		16.8	16.8		47.3	47.3		47.3	47.3	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.66	0.66		0.66	0.66	
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)	153	735		116	768		749	2075		720	2146	
v/s Ratio Prot		0.12			0.12			0.04			0.03	
v/s Ratio Perm	0.02			0.20			0.17			0.03		
v/c Ratio	0.08	0.50		0.84	0.53		0.26	0.06		0.05	0.05	
Uniform Delay, d1	21.6	24.0		26.4	24.2		5.2	4.4		4.4	4.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.5		40.0	0.7		0.9	0.1		0.1	0.0	
Delay (s)	21.9	24.6		66.4	24.8		6.0	4.5		4.5	4.4	
Level of Service	C	C		E	C		A	A		A	A	
Approach Delay (s)		24.5			32.7			5.4			4.5	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		21.2			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.41										
Actuated Cycle Length (s)		72.1			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		48.2%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

Rialto Impact Fee Study
50: Pepper Ave & Foothill Blvd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	499	175	150	422	72	116	260	128	61	334	77
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3353	1500	1583	3280		1583	3187		1583	3258	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.46	1.00		0.47	1.00	
Satd. Flow (perm)	1583	3353	1500	1583	3280		762	3187		789	3258	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	56	537	188	161	454	77	125	280	138	66	359	83
RTOR Reduction (vph)	0	0	141	0	14	0	0	54	0	0	18	0
Lane Group Flow (vph)	56	537	47	161	517	0	125	364	0	66	424	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	5.4	21.8	21.8	14.0	30.4		39.5	39.5		39.5	39.5	
Effective Green, g (s)	5.4	21.8	21.8	14.0	30.4		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.06	0.25	0.25	0.16	0.35		0.45	0.45		0.45	0.45	
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)	97	837	374	253	1142		344	1441		356	1474	
v/s Ratio Prot	0.04	c0.16		c0.10	0.16			0.11			0.13	
v/s Ratio Perm			0.03				c0.16			0.08		
v/c Ratio	0.58	0.64	0.13	0.64	0.45		0.36	0.25		0.19	0.29	
Uniform Delay, d1	39.8	29.3	25.4	34.3	22.0		15.7	14.8		14.3	15.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.1	1.7	0.2	5.2	0.3		3.0	0.4		1.1	0.5	
Delay (s)	47.9	31.0	25.5	39.4	22.3		18.6	15.2		15.4	15.5	
Level of Service	D	C	C	D	C		B	B		B	B	
Approach Delay (s)		30.9			26.3			16.0			15.5	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			23.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			87.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			56.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
1: Sierra Ave & I-15 NB Off Ramp/I-15 NB On Ramp

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop				Stop			Stop			Stop	
Volume (vph)	276	9	251	0	0	0	0	334	314	124	324	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	285	9	259	0	0	0	0	344	324	128	334	0
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	190	363	230	438	239	223						
Volume Left (vph)	190	95	0	0	128	0						
Volume Right (vph)	0	259	0	324	0	0						
Hadj (s)	0.53	-0.33	0.03	-0.48	0.30	0.03						
Departure Headway (s)	8.0	7.1	7.3	6.7	7.8	7.5						
Degree Utilization, x	0.42	0.71	0.46	0.82	0.52	0.46						
Capacity (veh/h)	437	491	473	524	440	464						
Control Delay (s)	15.4	24.7	15.2	32.3	17.6	15.7						
Approach Delay (s)	21.5		26.4		16.7							
Approach LOS	C		D		C							
Intersection Summary												
Delay			22.1									
Level of Service			C									
Intersection Capacity Utilization			60.1%	ICU Level of Service				B				
Analysis Period (min)			15									

Rialto Impact Fee Study
2: Sierra Ave & Riverside Ave

Existing Conditions
Timing Plan: PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	85	281	386	146	392	224
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	93	309	424	160	431	246
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	93	309	424	160	431	246
Volume Left (vph)	93	0	0	0	431	0
Volume Right (vph)	0	309	0	160	0	0
Hadj (s)	0.53	-0.67	0.03	-0.67	0.53	0.03
Departure Headway (s)	8.2	7.0	7.1	6.4	7.5	7.0
Degree Utilization, x	0.21	0.60	0.84	0.29	0.89	0.48
Capacity (veh/h)	424	489	497	540	472	505
Control Delay (s)	12.2	18.7	36.1	10.8	45.1	14.9
Approach Delay (s)	17.2		29.2		34.1	
Approach LOS	C		D		D	
Intersection Summary						
Delay			28.3			
Level of Service			D			
Intersection Capacity Utilization			61.0%	ICU Level of Service		B
Analysis Period (min)			15			

Rialto Impact Fee Study
3: Live Oak Ave & Riverside Ave

Existing Conditions
Timing Plan: PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↱	↑↑	↱	↱
Volume (vph)	224	258	62	242	178	25
Ideal Flow (vphpl)	1800	1800	1700	1800	1700	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.92		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3083		1583	3353	1583	1500
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3083		1583	3353	1583	1500
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	233	269	65	252	185	26
RTOR Reduction (vph)	178	0	0	0	0	20
Lane Group Flow (vph)	324	0	65	252	185	6
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	11.6		2.4	18.0	8.2	8.2
Effective Green, g (s)	11.6		2.4	18.0	8.2	8.2
Actuated g/C Ratio	0.34		0.07	0.53	0.24	0.24
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1045		111	1764	379	359
v/s Ratio Prot	c0.11		c0.04	0.08	c0.12	
v/s Ratio Perm						0.00
v/c Ratio	0.31		0.59	0.14	0.49	0.02
Uniform Delay, d1	8.3		15.4	4.1	11.2	9.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		7.7	0.0	1.0	0.0
Delay (s)	8.5		23.1	4.2	12.2	9.9
Level of Service	A		C	A	B	A
Approach Delay (s)	8.5			8.1	11.9	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			9.1		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.41			
Actuated Cycle Length (s)			34.2		Sum of lost time (s)	12.0
Intersection Capacity Utilization			40.2%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Rialto Impact Fee Study
4: Alder Ave & Riverside Ave

Existing Conditions
Timing Plan: PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Volume (vph)	192	66	141	268	47	58
Ideal Flow (vphpl)	1800	1800	1700	1800	1600	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3225		1583	3353	2891	1500
Flt Permitted	1.00		0.59	1.00	0.95	1.00
Satd. Flow (perm)	3225		982	3353	2891	1500
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	196	67	144	273	48	59
RTOR Reduction (vph)	37	0	0	0	0	53
Lane Group Flow (vph)	226	0	144	273	48	6
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	7.8		7.8	7.8	1.7	1.7
Effective Green, g (s)	7.8		7.8	7.8	1.7	1.7
Actuated g/C Ratio	0.45		0.45	0.45	0.10	0.10
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1437		437	1494	280	145
v/s Ratio Prot	0.07			0.08	c0.02	
v/s Ratio Perm			c0.15			0.00
v/c Ratio	0.16		0.33	0.18	0.17	0.04
Uniform Delay, d1	2.9		3.2	2.9	7.3	7.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		0.4	0.1	0.3	0.1
Delay (s)	2.9		3.6	3.0	7.5	7.3
Level of Service	A		A	A	A	A
Approach Delay (s)	2.9			3.2	7.4	
Approach LOS	A			A	A	
Intersection Summary						
HCM 2000 Control Delay			3.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.30			
Actuated Cycle Length (s)			17.5		Sum of lost time (s)	8.0
Intersection Capacity Utilization			29.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Rialto Impact Fee Study
5: Alder Ave & Sierra Lakes Pkwy/Casmalia St

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	168	98	283	144	8	59	150	283	31	199	16
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Flt	1.00	0.94		1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	1667		1583	1765	1500	1583	3025		1583	3353	1500
Flt Permitted	0.66	1.00		0.59	1.00	1.00	0.62	1.00		0.49	1.00	1.00
Satd. Flow (perm)	1100	1667		977	1765	1500	1032	3025		811	3353	1500
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	5	179	104	301	153	9	63	160	301	33	212	17
RTOR Reduction (vph)	0	30	0	0	0	4	0	221	0	0	0	12
Lane Group Flow (vph)	5	253	0	301	153	5	63	240	0	33	212	5
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	17.5	17.5		17.5	17.5	17.5	9.3	9.3		9.3	9.3	9.3
Effective Green, g (s)	17.5	17.5		17.5	17.5	17.5	9.3	9.3		9.3	9.3	9.3
Actuated g/C Ratio	0.50	0.50		0.50	0.50	0.50	0.27	0.27		0.27	0.27	0.27
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)	553	838		491	887	754	275	808		216	896	400
v/s Ratio Prot		0.15			0.09			c0.08			0.06	
v/s Ratio Perm	0.00			c0.31		0.00	0.06			0.04		0.00
v/c Ratio	0.01	0.30		0.61	0.17	0.01	0.23	0.30		0.15	0.24	0.01
Uniform Delay, d1	4.3	5.1		6.2	4.7	4.3	10.0	10.1		9.7	10.0	9.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		2.3	0.1	0.0	0.4	0.2		0.3	0.1	0.0
Delay (s)	4.3	5.3		8.5	4.8	4.3	10.4	10.4		10.1	10.1	9.4
Level of Service	A	A		A	A	A	B	B		B	B	A
Approach Delay (s)		5.3			7.2			10.4			10.1	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			8.4									A
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			34.8									8.0
Intersection Capacity Utilization			63.8%									B
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
6: Alder Ave & I-210 WB On/I-210 WB Off

Existing Conditions
Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	174	1	60	308	432	0	0	234	346
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		1.00	0.95			0.95	
Frt				1.00	0.85		1.00	1.00			0.91	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1583	1504		1583	3353			3053	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1583	1504		1583	3353			3053	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	183	1	63	324	455	0	0	246	364
RTOR Reduction (vph)	0	0	0	0	51	0	0	0	0	0	272	0
Lane Group Flow (vph)	0	0	0	183	13	0	324	455	0	0	338	0
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8								
Actuated Green, G (s)				9.9	9.9		18.1	35.6			13.5	
Effective Green, g (s)				9.9	9.9		18.1	35.6			13.5	
Actuated g/C Ratio				0.19	0.19		0.34	0.67			0.25	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				292	278		535	2231			770	
v/s Ratio Prot					0.01		c0.20	0.14			c0.11	
v/s Ratio Perm				c0.12								
v/c Ratio				0.63	0.05		0.61	0.20			0.44	
Uniform Delay, d1				20.1	17.9		14.7	3.5			16.8	
Progression Factor				1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2				4.2	0.1		1.9	0.0			0.4	
Delay (s)				24.3	18.0		16.7	3.5			17.2	
Level of Service				C	B		B	A			B	
Approach Delay (s)		0.0			22.6			9.0			17.2	
Approach LOS		A			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			14.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			53.5				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			58.4%				ICU Level of Service		B			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
7: Alder Ave & SR-210 EB Off/SR-210 EB On

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	316	2	298	0	0	0	0	424	204	133	275	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.95		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1681	1500					3190		1583	3353	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1681	1500					3190		1583	3353	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	326	2	307	0	0	0	0	437	210	137	284	0
RTOR Reduction (vph)	0	0	205	0	0	0	0	65	0	0	0	0
Lane Group Flow (vph)	0	328	102	0	0	0	0	582	0	137	284	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		19.7	19.7					18.7		8.8	31.5	
Effective Green, g (s)		19.7	19.7					18.7		8.8	31.5	
Actuated g/C Ratio		0.33	0.33					0.32		0.15	0.53	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		559	499					1007		235	1784	
v/s Ratio Prot								c0.18		c0.09	0.08	
v/s Ratio Perm		0.20	0.07									
v/c Ratio		0.59	0.20					0.58		0.58	0.16	
Uniform Delay, d1		16.4	14.1					16.9		23.5	7.1	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		1.6	0.2					0.8		3.7	0.0	
Delay (s)		18.0	14.3					17.8		27.1	7.1	
Level of Service		B	B					B		C	A	
Approach Delay (s)		16.2			0.0			17.8			13.6	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		16.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		59.2			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		58.4%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

Rialto Impact Fee Study
8: Alder Ave & Renaissance Pkwy

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	65	12	55	49	63	5	519	40	23	502	48
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.92		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)	1583	3275		1583	3071		1583	3317		1583	1765	1500
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1583	3275		1583	3071		1583	3317		1583	1765	1500
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	51	71	13	60	54	69	5	570	44	25	552	53
RTOR Reduction (vph)	0	12	0	0	61	0	0	6	0	0	0	28
Lane Group Flow (vph)	51	72	0	60	62	0	5	608	0	25	552	25
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Prot
Protected Phases	7	4		3	8		5	2		1	6	6
Permitted Phases												
Actuated Green, G (s)	3.6	5.2		4.0	5.6		0.5	23.5		0.7	23.7	23.7
Effective Green, g (s)	3.6	5.2		4.0	5.6		0.5	23.5		0.7	23.7	23.7
Actuated g/C Ratio	0.07	0.11		0.08	0.11		0.01	0.48		0.01	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
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)	115	344		128	348		16	1577		22	846	719
v/s Ratio Prot	0.03	c0.02		c0.04	0.02		0.00	0.18		c0.02	c0.31	0.02
v/s Ratio Perm												
v/c Ratio	0.44	0.21		0.47	0.18		0.31	0.39		1.14	0.65	0.04
Uniform Delay, d1	21.9	20.2		21.7	19.8		24.3	8.3		24.3	9.7	6.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.7	0.3		2.7	0.2		10.9	0.2		237.5	1.8	0.0
Delay (s)	24.7	20.5		24.4	20.1		35.1	8.5		261.9	11.5	6.8
Level of Service	C	C		C	C		D	A		F	B	A
Approach Delay (s)		22.1			21.5			8.7			21.1	
Approach LOS		C			C			A			C	
Intersection Summary												
HCM 2000 Control Delay			16.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			49.4			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			44.6%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
9: Alder Ave & Base Line Rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	309	143	180	316	62	43	363	35	44	304	26
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.98		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)	1583	1681		1583	1721		1583	1741		1583	1765	1500
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1583	1681		1583	1721		1583	1741		1583	1765	1500
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	39	332	154	194	340	67	46	390	38	47	327	28
RTOR Reduction (vph)	0	17	0	0	7	0	0	3	0	0	0	19
Lane Group Flow (vph)	39	469	0	194	400	0	46	425	0	47	327	9
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	3.9	30.7		14.6	41.4		3.8	31.5		3.8	31.5	31.5
Effective Green, g (s)	3.9	30.7		14.6	41.4		3.8	31.5		3.8	31.5	31.5
Actuated g/C Ratio	0.04	0.32		0.15	0.43		0.04	0.33		0.04	0.33	0.33
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)	63	534		239	737		62	567		62	575	489
v/s Ratio Prot	0.02	c0.28		c0.12	0.23		0.03	c0.24		c0.03	0.19	
v/s Ratio Perm												0.01
v/c Ratio	0.62	0.88		0.81	0.54		0.74	0.75		0.76	0.57	0.02
Uniform Delay, d1	45.6	31.2		39.7	20.6		45.9	29.0		45.9	26.9	22.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.7	15.1		18.5	0.8		37.6	8.8		40.5	4.0	0.1
Delay (s)	62.4	46.3		58.2	21.4		83.5	37.8		86.4	31.0	22.1
Level of Service	E	D		E	C		F	D		F	C	C
Approach Delay (s)		47.5			33.3			42.2			36.8	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			39.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			96.6			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			76.6%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
10: Locust Ave & Casmalia St

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	248	153	5	1	91	34	3	60	1	44	165	282
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00		1.00	0.96		1.00	1.00		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1757		1583	1693		1583	3346		1583	3036	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1757		1583	1693		1583	3346		1583	3036	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	310	191	6	1	114	42	4	75	1	55	206	352
RTOR Reduction (vph)	0	1	0	0	13	0	0	1	0	0	268	0
Lane Group Flow (vph)	310	196	0	1	143	0	4	75	0	55	290	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	18.4	29.0		0.5	11.1		0.5	10.9		4.1	14.5	
Effective Green, g (s)	18.4	29.0		0.5	11.1		0.5	10.9		4.1	14.5	
Actuated g/C Ratio	0.30	0.48		0.01	0.18		0.01	0.18		0.07	0.24	
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)	481	842		13	310		13	602		107	727	
v/s Ratio Prot	c0.20	0.11		0.00	c0.08		0.00	0.02		c0.03	c0.10	
v/s Ratio Perm												
v/c Ratio	0.64	0.23		0.08	0.46		0.31	0.12		0.51	0.40	
Uniform Delay, d1	18.2	9.2		29.8	22.0		29.8	20.8		27.2	19.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	0.1		2.5	1.1		13.0	0.1		4.1	0.4	
Delay (s)	21.2	9.4		32.3	23.1		42.8	20.9		31.4	19.7	
Level of Service	C	A		C	C		D	C		C	B	
Approach Delay (s)		16.6			23.2			22.0			20.7	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			60.5			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			47.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
11: Locust Ave & Base Line Rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	401	120	35	330	1	82	0	45	0	0	4
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.0		4.0	4.0		4.0		4.0			4.0
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00			1.00
Flt		0.97		1.00	1.00		1.00		0.85			0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00			1.00
Satd. Flow (prot)		3237		1583	3351		1583		1500			1500
Flt Permitted		1.00		0.95	1.00		0.76		1.00			1.00
Satd. Flow (perm)		3237		1583	3351		1262		1500			1500
Peak-hour factor, PHF	0.92	0.96	0.96	0.96	0.96	0.92	0.96	0.92	0.96	0.92	0.92	0.92
Adj. Flow (vph)	0	418	125	36	344	1	85	0	47	0	0	4
RTOR Reduction (vph)	0	31	0	0	0	0	0	0	35	0	0	3
Lane Group Flow (vph)	0	512	0	36	345	0	85	0	12	0	0	1
Turn Type	Prot	NA		Prot	NA		Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)		12.4		1.0	17.4		8.7		8.7			8.7
Effective Green, g (s)		12.4		1.0	17.4		8.7		8.7			8.7
Actuated g/C Ratio		0.36		0.03	0.51		0.26		0.26			0.26
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)		1177		46	1709		321		382			382
v/s Ratio Prot		c0.16		c0.02	0.10							
v/s Ratio Perm							c0.07		0.01			0.00
v/c Ratio		0.43		0.78	0.20		0.26		0.03			0.00
Uniform Delay, d1		8.2		16.4	4.6		10.1		9.5			9.5
Progression Factor		1.00		1.00	1.00		1.00		1.00			1.00
Incremental Delay, d2		0.3		57.8	0.1		0.4		0.0			0.0
Delay (s)		8.5		74.2	4.6		10.6		9.6			9.5
Level of Service		A		E	A		B		A			A
Approach Delay (s)		8.5			11.2			10.2			9.5	
Approach LOS		A			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			9.7				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			34.1				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			34.2%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	335	70	90	403	64	57
Ideal Flow (vphpl)	1800	1800	1700	1800	1700	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	0.88
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3266		1583	3353	1583	2640
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3266		1583	3353	1583	2640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	76	98	438	70	62
RTOR Reduction (vph)	22	0	0	0	0	51
Lane Group Flow (vph)	418	0	98	438	70	11
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	8.3		4.3	16.6	5.6	5.6
Effective Green, g (s)	8.3		4.3	16.6	5.6	5.6
Actuated g/C Ratio	0.27		0.14	0.55	0.19	0.19
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	897		225	1843	293	489
v/s Ratio Prot	c0.13		c0.06	0.13	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.47		0.44	0.24	0.24	0.02
Uniform Delay, d1	9.1		11.8	3.5	10.5	10.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		1.4	0.1	0.4	0.0
Delay (s)	9.5		13.2	3.6	10.9	10.1
Level of Service	A		B	A	B	B
Approach Delay (s)	9.5			5.3	10.5	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			7.6		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.39			
Actuated Cycle Length (s)			30.2		Sum of lost time (s)	12.0
Intersection Capacity Utilization			31.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Rialto Impact Fee Study
13: Ayala Dr & Casmalia St

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	65	134	108	34	10	136	484	112	1	314	8
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	
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)	1583	1765	1500	1583	1765	1500	1583	3258		1583	3340	
Flt Permitted	0.73	1.00	1.00	0.71	1.00	1.00	0.54	1.00		0.40	1.00	
Satd. Flow (perm)	1221	1765	1500	1182	1765	1500	893	3258		662	3340	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	31	73	151	121	38	11	153	544	126	1	353	9
RTOR Reduction (vph)	0	0	116	0	0	8	0	24	0	0	2	0
Lane Group Flow (vph)	31	73	35	121	38	3	153	646	0	1	360	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	7.1	7.1	7.1	7.1	7.1	7.1	15.7	15.7		15.7	15.7	
Effective Green, g (s)	7.1	7.1	7.1	7.1	7.1	7.1	15.7	15.7		15.7	15.7	
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23	0.23	0.51	0.51		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	
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)	281	406	345	272	406	345	455	1660		337	1702	
v/s Ratio Prot		0.04			0.02			c0.20			0.11	
v/s Ratio Perm	0.03		0.02	c0.10		0.00	0.17			0.00		
v/c Ratio	0.11	0.18	0.10	0.44	0.09	0.01	0.34	0.39		0.00	0.21	
Uniform Delay, d1	9.4	9.5	9.3	10.2	9.3	9.1	4.5	4.6		3.7	4.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2	0.1	1.2	0.1	0.0	0.4	0.2		0.0	0.1	
Delay (s)	9.5	9.7	9.5	11.3	9.4	9.1	4.9	4.8		3.7	4.2	
Level of Service	A	A	A	B	A	A	A	A		A	A	
Approach Delay (s)		9.5			10.8			4.8			4.2	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			6.0									
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			30.8									
Intersection Capacity Utilization			44.6%									
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
14: Ayala Dr & I-210 WB Ramps

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	298	6	200	505	532	0	0	354	202
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.95	
Frt				1.00	0.96	0.85	1.00	1.00			0.95	
Flt Protected				0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1504	1491	1425	2891	3353			3170	
Flt Permitted				0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1504	1491	1425	2891	3353			3170	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	317	6	213	537	566	0	0	377	215
RTOR Reduction (vph)	0	0	0	0	14	127	0	0	0	0	93	0
Lane Group Flow (vph)	0	0	0	187	169	39	537	566	0	0	499	0
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				14.1	14.1	14.1	17.4	38.2			16.8	
Effective Green, g (s)				14.1	14.1	14.1	17.4	38.2			16.8	
Actuated g/C Ratio				0.23	0.23	0.23	0.29	0.63			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)				351	348	333	834	2124			883	
v/s Ratio Prot							c0.19	0.17			c0.16	
v/s Ratio Perm				c0.12	0.11	0.03						
v/c Ratio				0.53	0.49	0.12	0.64	0.27			0.57	
Uniform Delay, d1				20.2	20.0	18.2	18.7	4.9			18.6	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				1.6	1.1	0.2	1.7	0.1			0.8	
Delay (s)				21.8	21.0	18.4	20.5	4.9			19.5	
Level of Service				C	C	B	C	A			B	
Approach Delay (s)		0.0			20.5			12.5			19.5	
Approach LOS		A			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.3		HCM 2000 Level of Service						B	
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			60.3		Sum of lost time (s)					12.0		
Intersection Capacity Utilization			55.3%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
15: Ayala Dr & I-210 EB Ramps

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	271	3	549	0	0	0	3	766	306	161	491	1
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1600	1800	1800
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	0.97	0.95	
Frt	1.00	0.87	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1504	1383	1425					3352	1500	2891	3352	
Flt Permitted	0.95	1.00	1.00					0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1504	1383	1425					3198	1500	2891	3352	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	288	3	584	0	0	0	3	815	326	171	522	1
RTOR Reduction (vph)	0	201	218	0	0	0	0	0	195	0	0	0
Lane Group Flow (vph)	259	111	86	0	0	0	0	818	131	171	523	0
Turn Type	Perm	NA	Perm				Perm	NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4				2		2			
Actuated Green, G (s)	19.1	19.1	19.1					27.3	27.3	9.4	40.7	
Effective Green, g (s)	19.1	19.1	19.1					27.3	27.3	9.4	40.7	
Actuated g/C Ratio	0.28	0.28	0.28					0.40	0.40	0.14	0.60	
Clearance Time (s)	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	
Lane Grp Cap (vph)	423	389	401					1287	603	400	2012	
v/s Ratio Prot										c0.06	0.16	
v/s Ratio Perm	c0.17	0.08	0.06					c0.26	0.09			
v/c Ratio	0.61	0.29	0.21					0.64	0.22	0.43	0.26	
Uniform Delay, d1	21.1	19.0	18.6					16.3	13.3	26.7	6.4	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	0.4	0.3					1.0	0.2	0.7	0.1	
Delay (s)	23.8	19.4	18.9					17.3	13.4	27.5	6.5	
Level of Service	C	B	B					B	B	C	A	
Approach Delay (s)		20.5			0.0			16.2			11.7	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.4		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			67.8		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			60.7%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
16: Ayala Dr & Renaissance Pkwy/Easton St

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	49	121	13	27	135	67	904	23	240	796	4
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	2996		1583	2933		1583	3353	1500	1583	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	2996		1583	2933		1583	3353	1500	1583	3353	1500
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	35	52	127	14	28	142	71	952	24	253	838	4
RTOR Reduction (vph)	0	109	0	0	126	0	0	0	14	0	0	2
Lane Group Flow (vph)	35	70	0	14	44	0	71	952	10	253	838	2
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	2.5	10.4		0.6	8.5		6.7	29.4	29.4	17.0	39.7	39.7
Effective Green, g (s)	2.5	10.4		0.6	8.5		6.7	29.4	29.4	17.0	39.7	39.7
Actuated g/C Ratio	0.03	0.14		0.01	0.12		0.09	0.40	0.40	0.23	0.54	0.54
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)	53	424		12	339		144	1343	600	366	1813	811
v/s Ratio Prot	c0.02	c0.02		0.01	0.02		0.04	c0.28		c0.16	0.25	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.66	0.17		1.17	0.13		0.49	0.71	0.02	0.69	0.46	0.00
Uniform Delay, d1	35.0	27.7		36.4	29.1		31.7	18.4	13.3	25.8	10.3	7.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.8	0.2		320.6	0.2		2.6	1.7	0.0	5.5	0.2	0.0
Delay (s)	61.8	27.9		357.0	29.3		34.4	20.2	13.3	31.3	10.5	7.7
Level of Service	E	C		F	C		C	C	B	C	B	A
Approach Delay (s)		33.4			54.2			21.0			15.3	
Approach LOS		C			D			C			B	
Intersection Summary												
HCM 2000 Control Delay			22.0			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			73.4			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			63.5%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
17: Cedar Ave/Ayala Dr & Base Line Rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	290	50	107	288	56	58	509	144	79	553	57
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3278		1583	3271		1583	1765	1500	1583	3306	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3278		1583	3271		1583	1765	1500	1583	3306	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	146	293	51	108	291	57	59	514	145	80	559	58
RTOR Reduction (vph)	0	14	0	0	16	0	0	0	79	0	7	0
Lane Group Flow (vph)	146	330	0	108	332	0	59	514	66	80	610	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	12.9	18.3		9.4	14.8		6.5	42.9	42.9	7.3	43.7	
Effective Green, g (s)	12.9	18.3		9.4	14.8		6.5	42.9	42.9	7.3	43.7	
Actuated g/C Ratio	0.14	0.19		0.10	0.16		0.07	0.46	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	
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)	217	638		158	515		109	806	685	123	1538	
v/s Ratio Prot	c0.09	c0.10		0.07	c0.10		0.04	c0.29		c0.05	0.18	
v/s Ratio Perm									0.04			
v/c Ratio	0.67	0.52		0.68	0.64		0.54	0.64	0.10	0.65	0.40	
Uniform Delay, d1	38.5	33.8		40.8	37.1		42.3	19.5	14.5	42.1	16.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.0	0.7		11.6	2.8		5.4	3.8	0.3	11.7	0.8	
Delay (s)	46.5	34.6		52.4	39.9		47.7	23.4	14.8	53.7	17.2	
Level of Service	D	C		D	D		D	C	B	D	B	
Approach Delay (s)		38.1			42.8			23.6			21.4	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.7			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			93.9			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			65.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
18: Cedar Ave & Foothill Blvd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	144	594	106	145	545	80	157	592	104	112	507	69
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		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)	1583	4708		1583	4725		1583	3278		1583	3292	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	4708		1583	4725		1583	3278		1583	3292	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	145	600	107	146	551	81	159	598	105	113	512	70
RTOR Reduction (vph)	0	26	0	0	19	0	0	13	0	0	10	0
Lane Group Flow (vph)	145	681	0	146	613	0	159	690	0	113	572	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	13.1	18.1		13.2	18.2		13.9	35.4		9.5	31.0	
Effective Green, g (s)	13.1	18.1		13.2	18.2		13.9	35.4		9.5	31.0	
Actuated g/C Ratio	0.14	0.20		0.14	0.20		0.15	0.38		0.10	0.34	
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)	224	924		226	932		238	1258		163	1106	
v/s Ratio Prot	0.09	c0.14		c0.09	0.13		c0.10	c0.21		0.07	0.17	
v/s Ratio Perm												
v/c Ratio	0.65	0.74		0.65	0.66		0.67	0.55		0.69	0.52	
Uniform Delay, d1	37.4	34.8		37.3	34.1		37.0	22.2		39.9	24.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.3	3.1		6.2	1.7		6.9	1.7		12.0	1.7	
Delay (s)	43.7	37.9		43.5	35.8		43.9	23.9		52.0	26.3	
Level of Service	D	D		D	D		D	C		D	C	
Approach Delay (s)		38.9			37.3			27.6			30.5	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			33.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			92.2			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			64.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
19: Cedar Ave & Rialto Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	192	160	73	140	115	157	774	55	74	619	86
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.93		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)	1583	3124		1583	3127		1583	3319		1583	3292	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3124		1583	3127		1583	3319		1583	3292	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	103	204	170	78	149	122	167	823	59	79	659	91
RTOR Reduction (vph)	0	144	0	0	105	0	0	5	0	0	11	0
Lane Group Flow (vph)	103	230	0	78	166	0	167	877	0	79	739	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.0	11.3		7.0	10.3		13.4	31.7		7.0	25.3	
Effective Green, g (s)	8.0	11.3		7.0	10.3		13.4	31.7		7.0	25.3	
Actuated g/C Ratio	0.11	0.15		0.10	0.14		0.18	0.43		0.10	0.35	
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)	173	483		151	441		290	1441		151	1140	
v/s Ratio Prot	c0.07	c0.07		0.05	0.05		c0.11	c0.26		0.05	0.22	
v/s Ratio Perm												
v/c Ratio	0.60	0.48		0.52	0.38		0.58	0.61		0.52	0.65	
Uniform Delay, d1	31.0	28.2		31.4	28.4		27.2	15.9		31.4	20.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	0.7		3.0	0.5		2.8	0.7		3.2	1.3	
Delay (s)	36.4	28.9		34.4	29.0		30.0	16.6		34.7	21.4	
Level of Service	D	C		C	C		C	B		C	C	
Approach Delay (s)		30.5			30.2			18.7			22.6	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			23.5			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			73.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			59.6%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
20: Cedar Ave & Merrill Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	251	66	51	214	92	75	749	31	122	669	117
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.95		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)	1583	3248		1583	3202		1583	3333		1583	3278	
Flt Permitted	0.54	1.00		0.52	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	892	3248		873	3202		1583	3333		1583	3278	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	133	261	69	53	223	96	78	780	32	127	697	122
RTOR Reduction (vph)	0	25	0	0	51	0	0	3	0	0	15	0
Lane Group Flow (vph)	133	305	0	53	268	0	78	809	0	127	804	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	17.5	17.5		17.5	17.5		6.8	24.9		9.0	27.1	
Effective Green, g (s)	17.5	17.5		17.5	17.5		6.8	24.9		9.0	27.1	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.11	0.39		0.14	0.43	
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)	246	896		240	883		169	1309		224	1401	
v/s Ratio Prot		0.09			0.08		0.05	0.24		c0.08	c0.25	
v/s Ratio Perm	c0.15			0.06								
v/c Ratio	0.54	0.34		0.22	0.30		0.46	0.62		0.57	0.57	
Uniform Delay, d1	19.5	18.3		17.7	18.1		26.6	15.4		25.4	13.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.2		0.5	0.2		2.0	0.9		3.3	0.6	
Delay (s)	21.9	18.6		18.2	18.3		28.6	16.3		28.7	14.3	
Level of Service	C	B		B	B		C	B		C	B	
Approach Delay (s)		19.5			18.3			17.4			16.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			63.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			61.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
21: Cedar Ave & Randall Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	120	41	36	88	52	41	810	63	67	681	26
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1698		1583	1765	1500	1583	3317		1583	3334	
Flt Permitted	0.70	1.00		0.63	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1163	1698		1045	1765	1500	1583	3317		1583	3334	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	42	124	42	37	91	54	42	835	65	69	702	27
RTOR Reduction (vph)	0	13	0	0	0	45	0	6	0	0	3	0
Lane Group Flow (vph)	42	153	0	37	91	9	42	894	0	69	726	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	8.5	8.5		8.5	8.5	8.5	2.4	26.1		4.5	28.2	
Effective Green, g (s)	8.5	8.5		8.5	8.5	8.5	2.4	26.1		4.5	28.2	
Actuated g/C Ratio	0.17	0.17		0.17	0.17	0.17	0.05	0.51		0.09	0.55	
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)	193	282		173	293	249	74	1694		139	1839	
v/s Ratio Prot		c0.09			0.05		0.03	c0.27		c0.04	0.22	
v/s Ratio Perm	0.04			0.04		0.01						
v/c Ratio	0.22	0.54		0.21	0.31	0.04	0.57	0.53		0.50	0.39	
Uniform Delay, d1	18.4	19.5		18.4	18.7	17.9	23.8	8.4		22.2	6.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	2.1		0.6	0.6	0.1	9.6	0.3		2.8	0.1	
Delay (s)	19.0	21.6		19.0	19.3	17.9	33.5	8.7		25.0	6.7	
Level of Service	B	C		B	B	B	C	A		C	A	
Approach Delay (s)		21.1			18.9			9.8			8.3	
Approach LOS		C			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			51.1				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			55.9%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
22: Cactus Ave/Country Club Dr & Riverside Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	371	30	58	396	24	40	18	47	22	14	10
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.89			0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1583	3316		1583	3324		1583	1574			3172	
Flt Permitted	0.95	1.00		0.95	1.00		1.00	1.00			0.94	
Satd. Flow (perm)	1583	3316		1583	3324		1667	1574			3046	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	7	386	31	60	412	25	42	19	49	23	15	10
RTOR Reduction (vph)	0	7	0	0	5	0	0	43	0	0	9	0
Lane Group Flow (vph)	7	410	0	60	432	0	42	25	0	0	39	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	0.7	9.5		2.1	10.9		3.6	3.6			3.6	
Effective Green, g (s)	0.7	9.5		2.1	10.9		3.6	3.6			3.6	
Actuated g/C Ratio	0.03	0.35		0.08	0.40		0.13	0.13			0.13	
Clearance Time (s)	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	
Lane Grp Cap (vph)	40	1158		122	1332		220	208			403	
v/s Ratio Prot	0.00	0.12		c0.04	c0.13			0.02				
v/s Ratio Perm							c0.03				0.01	
v/c Ratio	0.17	0.35		0.49	0.32		0.19	0.12			0.10	
Uniform Delay, d1	13.0	6.6		12.0	5.6		10.5	10.4			10.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	2.1	0.2		3.1	0.1		0.4	0.3			0.1	
Delay (s)	15.1	6.8		15.1	5.8		10.9	10.7			10.5	
Level of Service	B	A		B	A		B	B			B	
Approach Delay (s)		6.9			6.9			10.8			10.5	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			7.4			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			27.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			34.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
23: Cactus Ave & Casmalia St

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	19	37	52	13	19	5	70	170	25	7	117	19
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	22	42	59	15	22	6	80	193	28	8	133	22
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	123	42	176	125	74	88						
Volume Left (vph)	22	15	80	0	8	0						
Volume Right (vph)	59	6	0	28	0	22						
Hadj (s)	-0.22	0.02	0.26	-0.13	0.09	-0.14						
Departure Headway (s)	4.8	5.2	5.4	5.0	5.3	5.1						
Degree Utilization, x	0.16	0.06	0.26	0.17	0.11	0.12						
Capacity (veh/h)	691	633	651	698	644	674						
Control Delay (s)	8.7	8.5	9.0	7.8	7.8	7.6						
Approach Delay (s)	8.7	8.5	8.5		7.7							
Approach LOS	A	A	A		A							
Intersection Summary												
Delay			8.4									
Level of Service			A									
Intersection Capacity Utilization			29.4%		ICU Level of Service				A			
Analysis Period (min)			15									

Rialto Impact Fee Study
24: Cactus Ave & Easton St

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	9	81	131	43	44	29	98	230	35	25	153	8
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	10	86	139	46	47	31	104	245	37	27	163	9
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	235	123	227	160	108	90						
Volume Left (vph)	10	46	104	0	27	0						
Volume Right (vph)	139	31	0	37	0	9						
Hadj (s)	-0.31	-0.04	0.26	-0.13	0.16	-0.03						
Departure Headway (s)	5.3	5.8	6.1	5.7	6.2	6.0						
Degree Utilization, x	0.35	0.20	0.38	0.25	0.19	0.15						
Capacity (veh/h)	630	565	568	603	536	553						
Control Delay (s)	11.1	10.2	11.6	9.4	9.5	8.9						
Approach Delay (s)	11.1	10.2	10.7		9.2							
Approach LOS	B	B	B		A							
Intersection Summary												
Delay			10.4									
Level of Service			B									
Intersection Capacity Utilization			50.1%	ICU Level of Service		A						
Analysis Period (min)			15									

Rialto Impact Fee Study
25: Cactus Ave & Base Line Rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	432	94	101	375	71	64	240	90	74	210	60
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3263		1583	3273		1583	3216		1583	3241	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3263		1583	3273		1583	3216		1583	3241	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	81	465	101	109	403	76	69	258	97	80	226	65
RTOR Reduction (vph)	0	20	0	0	18	0	0	34	0	0	23	0
Lane Group Flow (vph)	81	546	0	109	461	0	69	321	0	80	268	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.5	19.2		8.9	20.6		7.0	26.7		7.5	27.2	
Effective Green, g (s)	7.5	19.2		8.9	20.6		7.0	26.7		7.5	27.2	
Actuated g/C Ratio	0.10	0.25		0.11	0.26		0.09	0.34		0.10	0.35	
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)	151	800		179	861		141	1096		151	1125	
v/s Ratio Prot	0.05	c0.17		c0.07	0.14		0.04	c0.10		c0.05	0.08	
v/s Ratio Perm												
v/c Ratio	0.54	0.68		0.61	0.54		0.49	0.29		0.53	0.24	
Uniform Delay, d1	33.7	26.8		33.0	24.7		33.9	18.9		33.7	18.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	2.4		5.8	0.6		2.7	0.7		3.3	0.5	
Delay (s)	37.4	29.2		38.8	25.4		36.6	19.6		37.1	18.7	
Level of Service	D	C		D	C		D	B		D	B	
Approach Delay (s)		30.2			27.9			22.3			22.6	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.5			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			78.3			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			50.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
26: Cactus Ave & Foothill Blvd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Volume (vph)	57	741	43	89	668	111	84	328	139	67	221	33
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.91		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	4778		1583	3353	1500	1583	3203		1583	3288	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.59	1.00		0.44	1.00	
Satd. Flow (perm)	1583	4778		1583	3353	1500	983	3203		729	3288	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	59	764	44	92	689	114	87	338	143	69	228	34
RTOR Reduction (vph)	0	7	0	0	0	77	0	39	0	0	10	0
Lane Group Flow (vph)	59	801	0	92	689	37	87	442	0	69	252	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	5.4	22.4		8.3	25.3	25.3	35.9	35.9		35.9	35.9	
Effective Green, g (s)	5.4	22.4		8.3	25.3	25.3	35.9	35.9		35.9	35.9	
Actuated g/C Ratio	0.07	0.28		0.11	0.32	0.32	0.46	0.46		0.46	0.46	
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)	108	1361		167	1079	482	448	1462		332	1501	
v/s Ratio Prot	0.04	0.17		c0.06	c0.21			c0.14			0.08	
v/s Ratio Perm						0.02	0.09			0.09		
v/c Ratio	0.55	0.59		0.55	0.64	0.08	0.19	0.30		0.21	0.17	
Uniform Delay, d1	35.4	24.1		33.4	22.7	18.5	12.7	13.5		12.8	12.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.5	0.7		3.9	1.3	0.1	1.0	0.5		1.4	0.2	
Delay (s)	41.0	24.8		37.3	24.0	18.6	13.7	14.0		14.2	12.8	
Level of Service	D	C		D	C	B	B	B		B	B	
Approach Delay (s)		25.9			24.7			13.9			13.1	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			21.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			78.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			54.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
27: Cactus Ave & Rialto Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	87	250	83	22	177	67	56	390	26	55	316	59
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
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)	1583	3228		1583	3214		1583	3322		1583	3274	
Flt Permitted	0.59	1.00		0.54	1.00		0.52	1.00		0.50	1.00	
Satd. Flow (perm)	991	3228		907	3214		869	3322		834	3274	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	91	260	86	23	184	70	58	406	27	57	329	61
RTOR Reduction (vph)	0	39	0	0	47	0	0	6	0	0	18	0
Lane Group Flow (vph)	91	307	0	23	207	0	58	427	0	57	372	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.9	8.9		8.9	8.9		9.7	9.7		9.7	9.7	
Effective Green, g (s)	8.9	8.9		8.9	8.9		9.7	9.7		9.7	9.7	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.36	0.36		0.36	0.36	
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)	331	1080		303	1075		316	1211		304	1193	
v/s Ratio Prot		c0.10			0.06			c0.13			0.11	
v/s Ratio Perm	0.09			0.03			0.07			0.07		
v/c Ratio	0.27	0.28		0.08	0.19		0.18	0.35		0.19	0.31	
Uniform Delay, d1	6.5	6.5		6.0	6.3		5.8	6.2		5.8	6.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.1		0.1	0.1		0.3	0.2		0.3	0.2	
Delay (s)	6.9	6.7		6.1	6.4		6.0	6.3		6.1	6.2	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		6.7			6.4			6.3			6.2	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			6.4			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			26.6			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			42.4%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
28: Cactus Ave & Merrill Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	280	30	30	205	51	21	368	25	61	305	54
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.97		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)	1583	3304		1583	3253		1583	3320		1583	3278	
Flt Permitted	0.58	1.00		0.55	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	974	3304		921	3253		1583	3320		1583	3278	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	64	298	32	32	218	54	22	391	27	65	324	57
RTOR Reduction (vph)	0	9	0	0	24	0	0	5	0	0	16	0
Lane Group Flow (vph)	64	321	0	32	248	0	22	413	0	65	365	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	10.4	10.4		10.4	10.4		1.1	12.9		4.1	15.9	
Effective Green, g (s)	10.4	10.4		10.4	10.4		1.1	12.9		4.1	15.9	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.03	0.33		0.10	0.40	
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)	257	872		243	858		44	1087		164	1322	
v/s Ratio Prot		c0.10			0.08		0.01	c0.12		c0.04	c0.11	
v/s Ratio Perm	0.07			0.03								
v/c Ratio	0.25	0.37		0.13	0.29		0.50	0.38		0.40	0.28	
Uniform Delay, d1	11.4	11.8		11.1	11.6		18.9	10.2		16.5	7.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.3		0.2	0.2		8.7	0.2		1.6	0.1	
Delay (s)	11.9	12.1		11.3	11.7		27.5	10.4		18.1	8.0	
Level of Service	B	B		B	B		C	B		B	A	
Approach Delay (s)		12.1			11.7			11.3			9.5	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			11.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			39.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			41.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
29: Cactus Ave & Randall Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	102	30	40	131	37	33	294	31	35	376	10
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1705		1583	1706		1583	3305		1583	3340	
Flt Permitted	0.52	1.00		0.62	1.00		0.51	1.00		0.54	1.00	
Satd. Flow (perm)	861	1705		1031	1706		848	3305		904	3340	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	6	110	32	43	141	40	35	316	33	38	404	11
RTOR Reduction (vph)	0	16	0	0	16	0	0	4	0	0	1	0
Lane Group Flow (vph)	6	126	0	43	165	0	35	345	0	38	414	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.8	11.8		11.8	11.8		48.6	48.6		48.6	48.6	
Effective Green, g (s)	11.8	11.8		11.8	11.8		48.6	48.6		48.6	48.6	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.71	0.71		0.71	0.71	
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)	148	294		177	294		602	2348		642	2373	
v/s Ratio Prot		0.07			c0.10			0.10			c0.12	
v/s Ratio Perm	0.01			0.04			0.04			0.04		
v/c Ratio	0.04	0.43		0.24	0.56		0.06	0.15		0.06	0.17	
Uniform Delay, d1	23.6	25.3		24.4	25.9		3.0	3.2		3.0	3.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.0		0.7	2.5		0.2	0.1		0.2	0.2	
Delay (s)	23.7	26.3		25.2	28.4		3.2	3.3		3.2	3.4	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		26.2			27.8			3.3			3.4	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			68.4			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			41.0%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
30: Cactus Ave & San Bernardino Ave/San Bernardino Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	26	256	13	37	198	5	5	118	61	14	168	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	278	14	40	215	5	5	128	66	15	183	38
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	167	153	148	113	5	195	15	221				
Volume Left (vph)	28	0	40	0	5	0	15	0				
Volume Right (vph)	0	14	0	5	0	66	0	38				
Hadj (s)	0.12	-0.03	0.17	0.00	0.53	-0.20	0.53	-0.09				
Departure Headway (s)	6.3	6.2	6.4	6.3	7.0	6.3	6.9	6.3				
Degree Utilization, x	0.29	0.26	0.26	0.20	0.01	0.34	0.03	0.39				
Capacity (veh/h)	539	552	526	539	481	541	486	539				
Control Delay (s)	10.7	10.1	10.5	9.6	8.9	11.2	8.9	12.0				
Approach Delay (s)	10.4		10.1		11.2		11.8					
Approach LOS	B		B		B		B					
Intersection Summary												
Delay			10.8									
Level of Service			B									
Intersection Capacity Utilization			38.8%		ICU Level of Service		A					
Analysis Period (min)			15									

Rialto Impact Fee Study
31: Cactus Ave & Valley Blvd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	468	6	1	392	209	5	1	5	185	1	66
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		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)	1583	3353	1500	1583	1765	1500	1583	1538		1583	1765	1500
Flt Permitted	0.43	1.00	1.00	0.46	1.00	1.00	0.76	1.00		0.75	1.00	1.00
Satd. Flow (perm)	715	3353	1500	766	1765	1500	1262	1538		1255	1765	1500
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	103	520	7	1	436	232	6	1	6	206	1	73
RTOR Reduction (vph)	0	0	4	0	0	128	0	4	0	0	0	48
Lane Group Flow (vph)	103	520	3	1	436	104	6	3	0	206	1	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	17.2	17.2	17.2	17.2	17.2	17.2	13.0	13.0		13.0	13.0	13.0
Effective Green, g (s)	17.2	17.2	17.2	17.2	17.2	17.2	13.0	13.0		13.0	13.0	13.0
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.45	0.45	0.34	0.34		0.34	0.34	0.34
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)	321	1509	675	344	794	675	429	523		427	600	510
v/s Ratio Prot		0.16			c0.25			0.00			0.00	
v/s Ratio Perm	0.14		0.00	0.00		0.07	0.00			c0.16		0.02
v/c Ratio	0.32	0.34	0.00	0.00	0.55	0.15	0.01	0.01		0.48	0.00	0.05
Uniform Delay, d1	6.7	6.8	5.8	5.8	7.7	6.2	8.4	8.3		9.9	8.3	8.5
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	0.6	0.1	0.0	0.0	0.8	0.1	0.0	0.0		0.9	0.0	0.0
Delay (s)	7.3	7.0	5.8	5.8	8.4	6.3	8.4	8.3		10.8	8.3	8.5
Level of Service	A	A	A	A	A	A	A	A		B	A	A
Approach Delay (s)		7.0			7.7			8.3			10.2	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			7.9									A
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			38.2							8.0		
Intersection Capacity Utilization			55.7%									B
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
32: Riverside Ave & I-210 WB Ramps

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											  	
Volume (vph)	0	0	0	585	2	358	652	716	0	0	686	142
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.86	1.00
Frt				1.00	0.97	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1504	1499	1425	2891	3353			6071	1500
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1504	1499	1425	2891	3353			6071	1500
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	603	2	369	672	738	0	0	707	146
RTOR Reduction (vph)	0	0	0	0	10	134	0	0	0	0	0	115
Lane Group Flow (vph)	0	0	0	338	323	169	672	738	0	0	707	31
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				23.7	23.7	23.7	22.6	42.1			15.5	15.5
Effective Green, g (s)				23.7	23.7	23.7	22.6	42.1			15.5	15.5
Actuated g/C Ratio				0.32	0.32	0.32	0.31	0.57			0.21	0.21
Clearance Time (s)				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
Lane Grp Cap (vph)				482	481	457	885	1912			1275	315
v/s Ratio Prot							c0.23	0.22			c0.12	
v/s Ratio Perm				c0.22	0.22	0.12						0.02
v/c Ratio				0.70	0.67	0.37	0.76	0.39			0.55	0.10
Uniform Delay, d1				21.9	21.7	19.3	23.1	8.7			26.1	23.5
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				4.6	3.7	0.5	3.8	0.1			0.5	0.1
Delay (s)				26.5	25.3	19.8	26.9	8.9			26.6	23.6
Level of Service				C	C	B	C	A			C	C
Approach Delay (s)		0.0			24.0			17.5			26.1	
Approach LOS		A			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			21.7									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			73.8								12.0	
Intersection Capacity Utilization			70.8%									ICU Level of Service C
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
33: Riverside Ave & I-210 EB Ramps

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  		 	 	
Volume (vph)	180	1	703	0	0	0	0	1188	534	312	959	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1600	1800	1800
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95					0.86	1.00	0.97	0.95	
Frt	1.00	0.85	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1426	1425					6071	1500	2891	3353	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1426	1425					6071	1500	2891	3353	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	184	1	717	0	0	0	0	1212	545	318	979	0
RTOR Reduction (vph)	0	83	83	0	0	0	0	0	334	0	0	0
Lane Group Flow (vph)	184	277	275	0	0	0	0	1212	211	318	979	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	21.3	21.3	21.3					29.3	29.3	13.2	46.5	
Effective Green, g (s)	21.3	21.3	21.3					29.3	29.3	13.2	46.5	
Actuated g/C Ratio	0.28	0.28	0.28					0.39	0.39	0.17	0.61	
Clearance Time (s)	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	
Lane Grp Cap (vph)	444	400	400					2346	579	503	2056	
v/s Ratio Prot		c0.19						0.20		c0.11	c0.29	
v/s Ratio Perm	0.12		0.19						0.14			
v/c Ratio	0.41	0.69	0.69					0.52	0.36	0.63	0.48	
Uniform Delay, d1	22.2	24.3	24.3					17.8	16.6	29.0	8.0	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	5.1	4.8					0.2	0.4	2.6	0.2	
Delay (s)	22.8	29.4	29.1					18.0	17.0	31.6	8.2	
Level of Service	C	C	C					B	B	C	A	
Approach Delay (s)		27.9			0.0			17.7			13.9	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.8		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			75.8		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			70.8%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
34: Riverside Ave & Easton St

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	272	95	35	117	93	279	86	1171	139	339	1103	220
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.91		0.97	0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	1693		1583	1765	1500	1583	4741		2891	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1583	1693		1583	1765	1500	1583	4741		2891	3353	1500
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	278	97	36	119	95	285	88	1195	142	346	1126	224
RTOR Reduction (vph)	0	14	0	0	0	235	0	14	0	0	0	98
Lane Group Flow (vph)	278	119	0	119	95	50	88	1323	0	346	1126	126
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	19.5	18.6		11.4	10.5	10.5	6.1	31.1		14.2	39.2	39.2
Effective Green, g (s)	19.5	18.6		11.4	10.5	10.5	6.1	31.1		14.2	39.2	39.2
Actuated g/C Ratio	0.21	0.20		0.12	0.12	0.12	0.07	0.34		0.16	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
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)	338	344		197	202	172	105	1614		449	1439	644
v/s Ratio Prot	c0.18	0.07		0.08	c0.05		0.06	0.28		c0.12	c0.34	
v/s Ratio Perm						0.03						0.08
v/c Ratio	0.82	0.34		0.60	0.47	0.29	0.84	0.82		0.77	0.78	0.20
Uniform Delay, d1	34.2	31.1		37.8	37.8	37.0	42.1	27.5		37.0	22.4	16.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.8	0.6		5.1	1.7	1.0	41.2	3.4		8.0	2.9	0.2
Delay (s)	49.1	31.7		43.0	39.5	38.0	83.4	30.9		45.0	25.2	16.4
Level of Service	D	C		D	D	D	F	C		D	C	B
Approach Delay (s)		43.5			39.4			34.2			28.1	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			33.2									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			91.3									Sum of lost time (s) 16.0
Intersection Capacity Utilization			74.0%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
35: Riverside Ave & Base Line Rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	485	69	122	541	147	112	592	75	208	644	79
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		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)	1583	3290		1583	4663		1583	3297		1583	3298	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3290		1583	4663		1583	3297		1583	3298	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	159	500	71	126	558	152	115	610	77	214	664	81
RTOR Reduction (vph)	0	11	0	0	49	0	0	10	0	0	9	0
Lane Group Flow (vph)	159	560	0	126	661	0	115	677	0	214	736	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	13.4	20.0		11.4	18.0		11.4	30.0		16.7	35.3	
Effective Green, g (s)	13.4	20.0		11.4	18.0		11.4	30.0		16.7	35.3	
Actuated g/C Ratio	0.14	0.21		0.12	0.19		0.12	0.32		0.18	0.38	
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)	225	699		191	891		191	1051		280	1237	
v/s Ratio Prot	c0.10	c0.17		0.08	0.14		0.07	0.21		c0.14	c0.22	
v/s Ratio Perm												
v/c Ratio	0.71	0.80		0.66	0.74		0.60	0.64		0.76	0.60	
Uniform Delay, d1	38.5	35.2		39.5	35.9		39.2	27.5		36.8	23.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.7	6.6		8.0	3.4		5.3	3.0		11.7	2.1	
Delay (s)	48.2	41.7		47.5	39.2		44.5	30.5		48.5	25.8	
Level of Service	D	D		D	D		D	C		D	C	
Approach Delay (s)		43.1			40.5			32.5			30.8	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			36.4			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			94.1			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			70.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
36: Riverside Ave & Foothill Blvd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	628	84	89	645	153	199	581	163	240	420	118
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	4732		1583	4679		1583	3353	1500	1583	3243	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	4732		1583	4679		1583	3353	1500	1583	3243	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	143	641	86	91	658	156	203	593	166	245	429	120
RTOR Reduction (vph)	0	16	0	0	38	0	0	0	120	0	26	0
Lane Group Flow (vph)	143	711	0	91	776	0	203	593	46	245	523	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	12.3	24.2		8.1	20.0		16.2	21.3	21.3	18.3	23.4	
Effective Green, g (s)	12.3	24.2		8.1	20.0		16.2	21.3	21.3	18.3	23.4	
Actuated g/C Ratio	0.14	0.28		0.09	0.23		0.18	0.24	0.24	0.21	0.27	
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	1302		145	1064		291	812	363	329	863	
v/s Ratio Prot	c0.09	0.15		0.06	c0.17		0.13	c0.18		c0.15	0.16	
v/s Ratio Perm									0.03			
v/c Ratio	0.65	0.55		0.63	0.73		0.70	0.73	0.13	0.74	0.61	
Uniform Delay, d1	35.7	27.2		38.4	31.4		33.6	30.7	26.0	32.6	28.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.4	0.5		8.2	2.5		7.1	3.4	0.2	8.8	1.2	
Delay (s)	42.1	27.6		46.7	34.0		40.7	34.1	26.2	41.4	29.4	
Level of Service	D	C		D	C		D	C	C	D	C	
Approach Delay (s)		30.0			35.3			34.1			33.1	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			33.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			87.9			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			70.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
37: Riverside Ave & Rialto Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	109	94	54	82	14	89	716	71	29	568	19
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1737	1500		1730	1500	1583	3308		1583	3337	
Flt Permitted		0.98	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1737	1500		1730	1500	1583	3308		1583	3337	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	52	114	98	56	85	15	93	746	74	30	592	20
RTOR Reduction (vph)	0	0	83	0	0	13	0	6	0	0	2	0
Lane Group Flow (vph)	0	166	15	0	141	2	93	814	0	30	610	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		13.4	13.4		12.2	12.2	8.4	42.0		3.3	36.9	
Effective Green, g (s)		13.4	13.4		12.2	12.2	8.4	42.0		3.3	36.9	
Actuated g/C Ratio		0.15	0.15		0.14	0.14	0.10	0.48		0.04	0.42	
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)		267	231		242	210	153	1598		60	1416	
v/s Ratio Prot		c0.10			c0.08		c0.06	c0.25		0.02	0.18	
v/s Ratio Perm			0.01			0.00						
v/c Ratio		0.62	0.07		0.58	0.01	0.61	0.51		0.50	0.43	
Uniform Delay, d1		34.4	31.4		35.0	32.2	37.7	15.4		41.0	17.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.4	0.1		3.5	0.0	6.7	1.2		6.4	1.0	
Delay (s)		38.8	31.5		38.5	32.2	44.3	16.5		47.4	18.6	
Level of Service		D	C		D	C	D	B		D	B	
Approach Delay (s)		36.1			37.9			19.4			19.9	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			23.3									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			86.9								16.0	
Intersection Capacity Utilization			52.3%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

Existing Conditions

38: Bloomington Ave & Riverside Ave & Merrill Ave

Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	36	253	68	14	42	247	64	3	1	126	748	44
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0				4.0	4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95				1.00	0.95			1.00	0.95	
Frt	1.00	0.96				1.00	0.99			1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00			0.95	1.00	
Satd. Flow (prot)	1583	3230				1676	3332			1676	3325	
Flt Permitted	0.71	1.00				0.49	1.00			0.95	1.00	
Satd. Flow (perm)	1178	3230				861	3332			1676	3325	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	40	278	75	15	46	271	70	3	1	138	822	48
RTOR Reduction (vph)	0	2	0	0	0	0	2	0	0	0	3	0
Lane Group Flow (vph)	40	366	0	0	0	317	71	0	0	139	867	0
Turn Type	Perm	NA			Perm	Perm	NA		Prot	Prot	NA	
Protected Phases		4				8	8		5	5	2	
Permitted Phases	4				8	8						
Actuated Green, G (s)	43.1	43.1				43.1	43.1			13.9	32.0	
Effective Green, g (s)	43.1	43.1				43.1	43.1			13.9	32.0	
Actuated g/C Ratio	0.41	0.41				0.41	0.41			0.13	0.30	
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)	477	1309				349	1350			219	1000	
v/s Ratio Prot		0.11					0.02			c0.08	c0.26	
v/s Ratio Perm	0.03					c0.37						
v/c Ratio	0.08	0.28				0.91	0.05			0.63	0.87	
Uniform Delay, d1	19.4	21.2				29.7	19.2			43.8	35.1	
Progression Factor	1.00	1.00				1.00	1.00			1.00	1.00	
Incremental Delay, d2	0.1	0.1				26.2	0.0			5.9	8.0	
Delay (s)	19.5	21.3				56.0	19.2			49.7	43.1	
Level of Service	B	C				E	B			D	D	
Approach Delay (s)		21.1					49.1				44.0	
Approach LOS		C					D				D	
Intersection Summary												
HCM 2000 Control Delay		41.6				HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio		0.85										
Actuated Cycle Length (s)		106.3				Sum of lost time (s)				16.0		
Intersection Capacity Utilization		76.9%				ICU Level of Service				D		
Analysis Period (min)		15										
c Critical Lane Group												

Rialto Impact Fee Study
39: Riverside Ave & Randall Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	57	63	68	68	35	67	935	94	24	635	44
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1625		1583	1676		1583	3307		1583	3320	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1625		1583	1676		1583	3307		1583	3320	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	27	59	66	71	71	36	70	974	98	25	661	46
RTOR Reduction (vph)	0	43	0	0	20	0	0	7	0	0	5	0
Lane Group Flow (vph)	27	82	0	71	87	0	70	1065	0	25	702	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.2	7.2		7.3	7.3		4.4	34.1		1.7	31.4	
Effective Green, g (s)	7.2	7.2		7.3	7.3		4.4	34.1		1.7	31.4	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.07	0.51		0.03	0.47	
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)	171	176		174	184		105	1700		40	1572	
v/s Ratio Prot	0.02	c0.05		0.04	c0.05		c0.04	c0.32		0.02	0.21	
v/s Ratio Perm												
v/c Ratio	0.16	0.47		0.41	0.48		0.67	0.63		0.62	0.45	
Uniform Delay, d1	26.8	27.7		27.5	27.7		30.2	11.5		32.0	11.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	2.0		1.6	1.9		14.8	0.7		26.7	0.2	
Delay (s)	27.2	29.7		29.0	29.6		45.1	12.3		58.7	11.9	
Level of Service	C	C		C	C		D	B		E	B	
Approach Delay (s)		29.3			29.4			14.3			13.5	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			66.3			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			54.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
40: Riverside Ave & San Bernardino Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	120	90	197	88	63	124	911	300	64	475	24
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Flt	1.00	0.94		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1651		1583	1765	1500	1583	3228		1583	3329	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1651		1583	1765	1500	1583	3228		1583	3329	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	122	92	201	90	64	127	930	306	65	485	24
RTOR Reduction (vph)	0	26	0	0	0	45	0	33	0	0	3	0
Lane Group Flow (vph)	41	188	0	201	90	19	127	1203	0	65	506	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	3.8	16.2		15.2	27.6	27.6	10.1	39.3		5.1	34.3	
Effective Green, g (s)	3.8	16.2		15.2	27.6	27.6	10.1	39.3		5.1	34.3	
Actuated g/C Ratio	0.04	0.18		0.17	0.30	0.30	0.11	0.43		0.06	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)	65	291		262	530	450	174	1381		87	1243	
v/s Ratio Prot	0.03	c0.11		c0.13	0.05		c0.08	c0.37		0.04	0.15	
v/s Ratio Perm						0.01						
v/c Ratio	0.63	0.64		0.77	0.17	0.04	0.73	0.87		0.75	0.41	
Uniform Delay, d1	43.3	35.1		36.6	23.7	22.7	39.5	23.9		42.7	21.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.2	4.8		12.6	0.2	0.0	14.2	6.3		29.0	0.2	
Delay (s)	61.6	40.0		49.2	23.8	22.8	53.7	30.3		71.7	21.5	
Level of Service	E	D		D	C	C	D	C		E	C	
Approach Delay (s)		43.4			38.0			32.4			27.2	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			33.1									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			91.8									Sum of lost time (s) 16.0
Intersection Capacity Utilization			78.7%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
41: Riverside Ave & Valley Blvd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	190	420	201	213	71	601	1210	324	72	695	54
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1600	1800	1800	1700	1800	1800
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	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		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)	1583	3353	1500	1583	3353	1500	2891	4665		1583	4766	
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)	1583	3353	1500	1583	3353	1500	2891	4665		1583	4766	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	95	194	429	205	217	72	613	1235	331	73	709	55
RTOR Reduction (vph)	0	0	366	0	0	56	0	46	0	0	8	0
Lane Group Flow (vph)	95	194	63	205	217	16	613	1520	0	73	756	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	8.5	13.1	13.1	15.5	20.1	20.1	22.7	39.4		5.2	21.9	
Effective Green, g (s)	8.5	13.1	13.1	15.5	20.1	20.1	22.7	39.4		5.2	21.9	
Actuated g/C Ratio	0.10	0.15	0.15	0.17	0.23	0.23	0.25	0.44		0.06	0.25	
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)	150	492	220	275	755	338	735	2060		92	1170	
v/s Ratio Prot	0.06	c0.06		c0.13	0.06		c0.21	c0.33		0.05	0.16	
v/s Ratio Perm			0.04			0.01						
v/c Ratio	0.63	0.39	0.29	0.75	0.29	0.05	0.83	0.74		0.79	0.65	
Uniform Delay, d1	38.8	34.5	33.9	35.0	28.6	27.1	31.5	20.6		41.5	30.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.4	0.5	0.7	10.5	0.2	0.1	8.1	1.4		36.1	1.2	
Delay (s)	47.3	35.0	34.6	45.4	28.8	27.1	39.6	22.0		77.5	31.4	
Level of Service	D	C	C	D	C	C	D	C		E	C	
Approach Delay (s)		36.4			35.5			27.0			35.4	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			31.2				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			89.2				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			68.1%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
42: Riverside Ave & I-10 WB Ramps

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	304	1	471	291	1664	0	0	980	336
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor				0.95	0.91	0.95	0.97	0.91			0.86	1.00
Frt				1.00	0.87	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1504	1390	1425	2891	4818			6071	1500
Flt Permitted				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1504	1390	1425	2891	4818			6071	1500
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	320	1	496	306	1752	0	0	1032	354
RTOR Reduction (vph)	0	0	0	0	11	43	0	0	0	0	0	232
Lane Group Flow (vph)	0	0	0	282	256	225	306	1752	0	0	1032	122
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				20.8	20.8	20.8	13.1	41.3			24.2	24.2
Effective Green, g (s)				20.8	20.8	20.8	13.1	41.3			24.2	24.2
Actuated g/C Ratio				0.30	0.30	0.30	0.19	0.59			0.35	0.35
Clearance Time (s)				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
Lane Grp Cap (vph)				446	412	422	540	2838			2095	517
v/s Ratio Prot							0.11	0.36			0.17	
v/s Ratio Perm				0.19	0.18	0.16						0.08
v/c Ratio				0.63	0.62	0.53	0.57	0.62			0.49	0.24
Uniform Delay, d1				21.3	21.3	20.6	25.9	9.3			18.1	16.4
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				2.9	2.9	1.3	1.4	0.4			0.2	0.2
Delay (s)				24.3	24.2	21.9	27.3	9.7			18.3	16.6
Level of Service				C	C	C	C	A			B	B
Approach Delay (s)		0.0			23.5			12.3			17.9	
Approach LOS		A			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.3									HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			70.1									Sum of lost time (s) 12.0
Intersection Capacity Utilization			102.0%									ICU Level of Service G
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
43: Riverside Ave & I-10 EB Ramps

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	818	4	284	0	0	0	0	1137	407	454	828	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1600	1800	1800
Total Lost time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor	0.95	0.91	0.95					0.91		0.97	0.95	
Frt	1.00	0.99	0.85					0.96		1.00	1.00	
Flt Protected	0.95	0.96	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1504	1519	1425					4627		2891	3353	
Flt Permitted	0.95	0.96	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1504	1519	1425					4627		2891	3353	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	826	4	287	0	0	0	0	1148	411	459	836	0
RTOR Reduction (vph)	0	3	110	0	0	0	0	71	0	0	0	0
Lane Group Flow (vph)	430	426	148	0	0	0	0	1488	0	459	836	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)	28.5	28.5	28.5					31.9		15.7	51.6	
Effective Green, g (s)	28.5	28.5	28.5					31.9		15.7	51.6	
Actuated g/C Ratio	0.32	0.32	0.32					0.36		0.18	0.59	
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)	486	491	460					1675		515	1963	
v/s Ratio Prot								c0.32		c0.16	0.25	
v/s Ratio Perm	c0.29	0.28	0.10									
v/c Ratio	0.88	0.87	0.32					0.89		0.89	0.43	
Uniform Delay, d1	28.2	28.0	22.5					26.4		35.4	10.1	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	17.2	15.0	0.4					6.2		17.4	0.1	
Delay (s)	45.5	43.0	22.9					32.6		52.8	10.2	
Level of Service	D	D	C					C		D	B	
Approach Delay (s)		39.3			0.0			32.6			25.3	
Approach LOS		D			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			32.1					HCM 2000 Level of Service			C	
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			88.1					Sum of lost time (s)		12.0		
Intersection Capacity Utilization			102.0%					ICU Level of Service		G		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
44: Riverside Ave & Slover Ave

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	332	39	61	22	19	23	69	1251	21	32	887	199
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.92		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3045		1583	3079		1583	3345		1583	3261	
Flt Permitted	0.73	1.00		0.69	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1211	3045		1145	3079		1583	3345		1583	3261	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	342	40	63	23	20	24	71	1290	22	33	914	205
RTOR Reduction (vph)	0	42	0	0	16	0	0	1	0	0	18	0
Lane Group Flow (vph)	342	61	0	23	28	0	71	1311	0	33	1101	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	28.8	28.8		28.8	28.8		5.1	41.9		2.0	38.8	
Effective Green, g (s)	28.8	28.8		28.8	28.8		5.1	41.9		2.0	38.8	
Actuated g/C Ratio	0.34	0.34		0.34	0.34		0.06	0.49		0.02	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)	411	1035		389	1046		95	1654		37	1493	
v/s Ratio Prot		0.02			0.01		c0.04	c0.39		0.02	0.34	
v/s Ratio Perm	c0.28			0.02								
v/c Ratio	0.83	0.06		0.06	0.03		0.75	0.79		0.89	0.74	
Uniform Delay, d1	25.7	18.8		18.8	18.6		39.2	17.8		41.2	18.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.4	0.0		0.1	0.0		27.0	2.7		104.8	1.9	
Delay (s)	39.1	18.9		18.9	18.6		66.2	20.5		146.1	20.7	
Level of Service	D	B		B	B		E	C		F	C	
Approach Delay (s)		34.4			18.7			22.8			24.3	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		25.0			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		84.7			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		77.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

Rialto Impact Fee Study
45: Riverside Ave & Jurupa Ave

Existing Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	49	99	71	1170	1014	53
Ideal Flow (vphpl)	1700	1800	1700	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1583	1500	1583	4818	3328	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1583	1500	1583	4818	3328	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	51	102	73	1206	1045	55
RTOR Reduction (vph)	0	90	0	0	4	0
Lane Group Flow (vph)	51	12	73	1206	1096	0
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	5.8	5.8	4.5	36.8	28.3	
Effective Green, g (s)	5.8	5.8	4.5	36.8	28.3	
Actuated g/C Ratio	0.11	0.11	0.09	0.73	0.56	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	181	171	140	3504	1861	
v/s Ratio Prot	c0.03		c0.05	0.25	c0.33	
v/s Ratio Perm		0.01				
v/c Ratio	0.28	0.07	0.52	0.34	0.59	
Uniform Delay, d1	20.5	20.0	22.0	2.5	7.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.2	3.5	0.1	0.5	
Delay (s)	21.4	20.2	25.5	2.6	7.8	
Level of Service	C	C	C	A	A	
Approach Delay (s)	20.6			3.9	7.8	
Approach LOS	C			A	A	

Intersection Summary

HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Rialto Impact Fee Study
46: Riverside Ave & Agua Mansa Rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	366	89	53	138	43	112	873	96	47	812	105
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		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)	1583	1765	1500	1583	1765	1500	1583	3303		1583	3353	1500
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)	1583	1765	1500	1583	1765	1500	1583	3303		1583	3353	1500
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	167	381	93	55	144	45	117	909	100	49	846	109
RTOR Reduction (vph)	0	0	64	0	0	36	0	8	0	0	0	71
Lane Group Flow (vph)	167	381	29	55	144	9	117	1001	0	49	846	38
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	14.4	25.9	25.9	5.1	16.6	16.6	8.2	33.6		3.6	29.0	29.0
Effective Green, g (s)	14.4	25.9	25.9	5.1	16.6	16.6	8.2	33.6		3.6	29.0	29.0
Actuated g/C Ratio	0.17	0.31	0.31	0.06	0.20	0.20	0.10	0.40		0.04	0.34	0.34
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)	270	542	461	95	347	295	154	1318		67	1154	516
v/s Ratio Prot	c0.11	c0.22		0.03	0.08		c0.07	c0.30		0.03	0.25	
v/s Ratio Perm			0.02			0.01						0.03
v/c Ratio	0.62	0.70	0.06	0.58	0.41	0.03	0.76	0.76		0.73	0.73	0.07
Uniform Delay, d1	32.4	25.8	20.6	38.5	29.6	27.3	37.0	21.8		39.8	24.2	18.6
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	4.2	4.1	0.1	8.3	0.8	0.0	19.2	2.6		33.4	2.4	0.1
Delay (s)	36.5	29.9	20.6	46.8	30.4	27.3	56.2	24.4		73.2	26.6	18.6
Level of Service	D	C	C	D	C	C	E	C		E	C	B
Approach Delay (s)		30.3			33.5			27.7			28.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.8									
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			84.2									
Intersection Capacity Utilization			69.0%									
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
47: Acacia Ave & Base Line Rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	533	50	10	560	20	37	88	23	18	47	34
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.98			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1583	3310		1583	3336			1707			1668	
Flt Permitted	0.42	1.00		0.42	1.00			0.89			0.91	
Satd. Flow (perm)	697	3310		695	3336			1536			1539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	35	567	53	11	596	21	39	94	24	19	50	36
RTOR Reduction (vph)	0	8	0	0	3	0	0	8	0	0	24	0
Lane Group Flow (vph)	35	612	0	11	614	0	0	149	0	0	81	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.0	13.0		13.0	13.0			6.5			6.5	
Effective Green, g (s)	13.0	13.0		13.0	13.0			6.5			6.5	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.24			0.24	
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)	329	1564		328	1577			363			363	
v/s Ratio Prot		c0.18			0.18							
v/s Ratio Perm	0.05			0.02				c0.10			0.05	
v/c Ratio	0.11	0.39		0.03	0.39			0.41			0.22	
Uniform Delay, d1	4.0	4.7		3.9	4.7			8.9			8.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.2		0.0	0.2			0.8			0.3	
Delay (s)	4.2	4.9		3.9	4.8			9.6			8.8	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		4.8			4.8			9.6			8.8	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			5.6			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			27.5			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			43.5%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
48: Acacia Ave & Foothill Blvd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	773	69	29	716	63	67	100	42	31	103	58
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1583	4758		1583	3312			1689			1679	
Flt Permitted	0.95	1.00		0.95	1.00			0.87			0.93	
Satd. Flow (perm)	1583	4758		1583	3312			1490			1574	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	52	805	72	30	746	66	70	104	44	32	107	60
RTOR Reduction (vph)	0	10	0	0	6	0	0	10	0	0	17	0
Lane Group Flow (vph)	52	867	0	30	806	0	0	208	0	0	182	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	4.1	24.2		2.3	22.4			14.4			14.4	
Effective Green, g (s)	4.1	24.2		2.3	22.4			14.4			14.4	
Actuated g/C Ratio	0.08	0.46		0.04	0.42			0.27			0.27	
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)	122	2176		68	1402			405			428	
v/s Ratio Prot	c0.03	0.18		0.02	c0.24							
v/s Ratio Perm								c0.14			0.12	
v/c Ratio	0.43	0.40		0.44	0.57			0.51			0.42	
Uniform Delay, d1	23.3	9.5		24.7	11.6			16.3			15.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.4	0.1		4.5	0.6			1.1			0.7	
Delay (s)	25.7	9.6		29.2	12.2			17.4			16.5	
Level of Service	C	A		C	B			B			B	
Approach Delay (s)		10.5			12.8			17.4			16.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			52.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			58.4%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Rialto Impact Fee Study
49: Pepper Ave & Base Line Rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	404	172	77	410	13	200	47	113	23	24	11
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	1.00		1.00	0.89		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3203		1583	3337		1583	2998		1583	3194	
Flt Permitted	0.38	1.00		0.24	1.00		0.73	1.00		0.64	1.00	
Satd. Flow (perm)	631	3203		401	3337		1218	2998		1074	3194	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	11	430	183	82	436	14	213	50	120	24	26	12
RTOR Reduction (vph)	0	64	0	0	3	0	0	44	0	0	4	0
Lane Group Flow (vph)	11	549	0	82	447	0	213	126	0	24	34	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.9	18.9		18.9	18.9		47.2	47.2		47.2	47.2	
Effective Green, g (s)	18.9	18.9		18.9	18.9		47.2	47.2		47.2	47.2	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.64	0.64		0.64	0.64	
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)	160	816		102	851		775	1909		684	2034	
v/s Ratio Prot		0.17			0.13			0.04			0.01	
v/s Ratio Perm	0.02			0.20			0.17			0.02		
v/c Ratio	0.07	0.67		0.80	0.53		0.27	0.07		0.04	0.02	
Uniform Delay, d1	20.9	24.8		25.9	23.7		5.9	5.1		5.0	4.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	2.2		35.2	0.6		0.9	0.1		0.1	0.0	
Delay (s)	21.1	27.0		61.0	24.3		6.8	5.2		5.1	4.9	
Level of Service	C	C		E	C		A	A		A	A	
Approach Delay (s)		26.9			30.0			6.1			5.0	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		22.1			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.43										
Actuated Cycle Length (s)		74.1			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		51.4%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

Rialto Impact Fee Study
50: Pepper Ave & Foothill Blvd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	487	170	81	496	36	151	336	164	46	230	79
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3353	1500	1583	3319		1583	3188		1583	3225	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.55	1.00		0.42	1.00	
Satd. Flow (perm)	1583	3353	1500	1583	3319		913	3188		693	3225	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	110	518	181	86	528	38	161	357	174	49	245	84
RTOR Reduction (vph)	0	0	135	0	6	0	0	50	0	0	29	0
Lane Group Flow (vph)	110	518	46	86	560	0	161	481	0	49	300	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	9.4	21.4	21.4	8.0	20.0		42.1	42.1		42.1	42.1	
Effective Green, g (s)	9.4	21.4	21.4	8.0	20.0		42.1	42.1		42.1	42.1	
Actuated g/C Ratio	0.11	0.26	0.26	0.10	0.24		0.50	0.50		0.50	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)	178	859	384	151	794		460	1607		349	1626	
v/s Ratio Prot	c0.07	0.15		0.05	c0.17			0.15			0.09	
v/s Ratio Perm			0.03				c0.18			0.07		
v/c Ratio	0.62	0.60	0.12	0.57	0.71		0.35	0.30		0.14	0.18	
Uniform Delay, d1	35.3	27.3	23.8	36.1	29.1		12.5	12.1		11.0	11.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.3	1.2	0.1	4.9	2.9		2.1	0.5		0.8	0.3	
Delay (s)	41.6	28.5	24.0	41.0	31.9		14.6	12.6		11.9	11.6	
Level of Service	D	C	C	D	C		B	B		B	B	
Approach Delay (s)		29.3			33.1			13.0			11.6	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			23.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			83.5			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			54.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: Sierra Ave & I-15 NB Off Ramp/I-15 NB On Ramp

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop				Stop			Stop			Stop	
Traffic Volume (vph)	196	2	262	0	0	0	0	645	312	94	1752	0
Future Volume (vph)	196	2	262	0	0	0	0	645	312	94	1752	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	209	2	279	0	0	0	0	686	332	100	1864	0
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	139	351	457	561	721	1243						
Volume Left (vph)	139	70	0	0	100	0						
Volume Right (vph)	0	279	0	332	0	0						
Hadj (s)	0.53	-0.42	0.03	-0.38	0.10	0.03						
Departure Headway (s)	9.5	8.6	8.0	7.6	8.1	8.0						
Degree Utilization, x	0.37	0.83	1.00	1.00	1.00	1.00						
Capacity (veh/h)	375	416	457	561	721	1243						
Control Delay (s)	16.8	40.8	69.9	67.9	70.2	69.9						
Approach Delay (s)	34.0		68.8		70.0							
Approach LOS	D		F		F							
Intersection Summary												
Delay			64.5									
Level of Service			F									
Intersection Capacity Utilization			107.6%	ICU Level of Service		G						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Sierra Ave & Riverside Ave

2040 Conditions

AM Peak Hour

																
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Sign Control	Stop			Stop				Stop			Stop					
Traffic Volume (vph)	14	34	0	10	156	671	0	411	8	683	958	49				
Future Volume (vph)	14	34	0	10	156	671	0	411	8	683	958	49				
Peak Hour Factor	0.92	0.92	0.92	0.94	0.92	0.94	0.92	0.94	0.94	0.94	0.94	0.92				
Hourly flow rate (vph)	15	37	0	11	170	714	0	437	9	727	1019	53				
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2								
Volume Total (vph)	15	37	11	884	437	9	727	1072								
Volume Left (vph)	15	0	11	0	0	0	727	0								
Volume Right (vph)	0	0	0	714	0	9	0	53								
Hadj (s)	0.53	0.03	0.53	-0.53	0.03	-0.67	0.53	0.00								
Departure Headway (s)	10.0	9.5	8.5	7.4	8.1	7.4	8.1	7.6								
Degree Utilization, x	0.04	0.10	0.03	1.00	0.98	0.02	1.00	1.00								
Capacity (veh/h)	351	370	411	884	437	481	727	1072								
Control Delay (s)	12.2	12.3	10.5	67.0	64.7	9.3	70.5	68.0								
Approach Delay (s)	12.3		66.3		63.6		69.0									
Approach LOS	B		F		F		F									
Intersection Summary																
Delay			66.6													
Level of Service			F													
Intersection Capacity Utilization			141.5%		ICU Level of Service		H									
Analysis Period (min)			15													

HCM Signalized Intersection Capacity Analysis

3: Live Oak Ave & Riverside Ave

2040 Conditions
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Traffic Volume (vph)	967	151	32	636	281	112
Future Volume (vph)	967	151	32	636	281	112
Ideal Flow (vphpl)	1800	1800	1700	1800	1700	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3285		1583	3353	1583	1500
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3285		1583	3353	1583	1500
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	1240	194	41	815	360	144
RTOR Reduction (vph)	13	0	0	0	0	87
Lane Group Flow (vph)	1421	0	41	815	360	57
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	38.9		2.0	44.9	22.2	22.2
Effective Green, g (s)	38.9		2.0	44.9	22.2	22.2
Actuated g/C Ratio	0.52		0.03	0.60	0.30	0.30
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1701		42	2004	467	443
v/s Ratio Prot	c0.43		c0.03	0.24	c0.23	
v/s Ratio Perm						0.04
v/c Ratio	0.84		0.98	0.41	0.77	0.13
Uniform Delay, d1	15.4		36.5	8.0	24.1	19.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	3.7		128.6	0.1	7.7	0.1
Delay (s)	19.1		165.2	8.2	31.8	19.5
Level of Service	B		F	A	C	B
Approach Delay (s)	19.1			15.7	28.3	
Approach LOS	B			B	C	
Intersection Summary						
HCM 2000 Control Delay			19.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.82			
Actuated Cycle Length (s)			75.1		Sum of lost time (s)	12.0
Intersection Capacity Utilization			57.4%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

4: Alder Ave & Riverside Ave

2040 Conditions
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	770	255	174	568	224	123
Future Volume (vph)	770	255	174	568	224	123
Ideal Flow (vphpl)	1800	1800	1700	1800	1600	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3048		1495	3167	2730	1417
Flt Permitted	1.00		0.21	1.00	0.95	1.00
Satd. Flow (perm)	3048		331	3167	2730	1417
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	875	290	198	645	255	140
RTOR Reduction (vph)	40	0	0	0	0	115
Lane Group Flow (vph)	1125	0	198	645	255	25
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	48.5		48.5	48.5	12.3	12.3
Effective Green, g (s)	48.5		48.5	48.5	12.3	12.3
Actuated g/C Ratio	0.70		0.70	0.70	0.18	0.18
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2148		233	2232	488	253
v/s Ratio Prot	0.37			0.20	c0.09	
v/s Ratio Perm			c0.60			0.02
v/c Ratio	0.52		0.85	0.29	0.52	0.10
Uniform Delay, d1	4.7		7.5	3.8	25.6	23.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		24.0	0.1	1.0	0.2
Delay (s)	5.0		31.5	3.8	26.6	23.8
Level of Service	A		C	A	C	C
Approach Delay (s)	5.0			10.3	25.6	
Approach LOS	A			B	C	
Intersection Summary						
HCM 2000 Control Delay			10.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.78			
Actuated Cycle Length (s)			68.8		Sum of lost time (s)	8.0
Intersection Capacity Utilization			59.4%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

5: Alder Ave & Sierra Lakes Pkwy/Casmalia St

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	33	65	530	35	31	63	273	301	25	478	13
Future Volume (vph)	8	33	65	530	35	31	63	273	301	25	478	13
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1495	1500		1495	1667	1417	1495	2917		1495	3167	1417
Flt Permitted	0.73	1.00		0.69	1.00	1.00	0.36	1.00		0.27	1.00	1.00
Satd. Flow (perm)	1155	1500		1088	1667	1417	561	2917		432	3167	1417
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	8	34	68	552	36	32	66	284	314	26	498	14
RTOR Reduction (vph)	0	26	0	0	0	12	0	203	0	0	0	10
Lane Group Flow (vph)	8	76	0	552	36	20	66	395	0	26	498	4
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	40.7	40.7		40.7	40.7	40.7	17.8	17.8		17.8	17.8	17.8
Effective Green, g (s)	40.7	40.7		40.7	40.7	40.7	17.8	17.8		17.8	17.8	17.8
Actuated g/C Ratio	0.61	0.61		0.61	0.61	0.61	0.27	0.27		0.27	0.27	0.27
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)	706	918		665	1020	867	150	780		115	847	379
v/s Ratio Prot		0.05			0.02			0.14			c0.16	
v/s Ratio Perm	0.01			c0.51		0.01	0.12			0.06		0.00
v/c Ratio	0.01	0.08		0.83	0.04	0.02	0.44	0.51		0.23	0.59	0.01
Uniform Delay, d1	5.0	5.3		10.2	5.1	5.1	20.2	20.6		19.0	21.2	17.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	0.0		8.6	0.0	0.0	2.1	0.5		1.0	1.0	0.0
Delay (s)	5.0	5.3		18.8	5.1	5.1	22.3	21.1		20.0	22.2	17.9
Level of Service	A	A		B	A	A	C	C		B	C	B
Approach Delay (s)		5.3			17.3			21.3			22.0	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.3									B
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			66.5								8.0	
Intersection Capacity Utilization			71.0%								C	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: Alder Ave & I-210 WB On/I-210 WB Off

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	409	1	99	436	543	0	0	430	643
Future Volume (vph)	0	0	0	409	1	99	436	543	0	0	430	643
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		1.00	0.95			0.95	
Frt				1.00	0.85		1.00	1.00			0.91	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1495	1419		1495	3167			2882	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1495	1419		1495	3167			2882	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	440	1	106	469	584	0	0	462	691
RTOR Reduction (vph)	0	0	0	0	75	0	0	0	0	0	300	0
Lane Group Flow (vph)	0	0	0	440	32	0	469	584	0	0	853	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8								
Actuated Green, G (s)				26.0	26.0		27.0	56.0			25.0	
Effective Green, g (s)				26.0	26.0		27.0	56.0			25.0	
Actuated g/C Ratio				0.29	0.29		0.30	0.62			0.28	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				431	409		448	1970			800	
v/s Ratio Prot					0.02		c0.31	0.18			c0.30	
v/s Ratio Perm				c0.29								
v/c Ratio				1.02	0.08		1.05	0.30			1.07	
Uniform Delay, d1				32.0	23.3		31.5	7.9			32.5	
Progression Factor				1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2				48.8	0.1		55.3	0.1			50.8	
Delay (s)				80.8	23.4		86.8	8.0			83.3	
Level of Service				F	C		F	A			F	
Approach Delay (s)		0.0			69.5			43.1			83.3	
Approach LOS		A			E			D			F	
Intersection Summary												
HCM 2000 Control Delay			65.2				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			96.7%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: Alder Ave & SR-210 EB Off/SR-210 EB On

2040 Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	247	2	697	0	0	0	0	734	272	60	785	0
Future Volume (vph)	247	2	697	0	0	0	0	734	272	60	785	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.96		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1588	1354					2904		1495	3027	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1588	1354					2904		1495	3027	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	266	2	749	0	0	0	0	789	292	65	844	0
RTOR Reduction (vph)	0	0	39	0	0	0	0	42	0	0	0	0
Lane Group Flow (vph)	0	268	710	0	0	0	0	1039	0	65	844	0
Heavy Vehicles (%)	8%	8%	13%	8%	8%	8%	8%	13%	13%	8%	13%	8%
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		44.0	44.0					30.0		4.0	38.0	
Effective Green, g (s)		44.0	44.0					30.0		4.0	38.0	
Actuated g/C Ratio		0.49	0.49					0.33		0.04	0.42	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		776	661					968		66	1278	
v/s Ratio Prot								c0.36		c0.04	0.28	
v/s Ratio Perm		0.17	c0.52									
v/c Ratio		0.35	1.07					1.07		0.98	0.66	
Uniform Delay, d1		14.1	23.0					30.0		43.0	20.8	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.3	56.7					50.7		104.8	1.3	
Delay (s)		14.4	79.7					80.7		147.8	22.1	
Level of Service		B	E					F		F	C	
Approach Delay (s)		62.5			0.0			80.7			31.1	
Approach LOS		E			A			F			C	
Intersection Summary												
HCM 2000 Control Delay			59.6					HCM 2000 Level of Service			E	
HCM 2000 Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			90.0					Sum of lost time (s)		12.0		
Intersection Capacity Utilization			96.7%					ICU Level of Service		F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Alder Ave & Renaissance Pkwy

2040 Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	180	39	100	221	170	35	681	25	573	789	105
Future Volume (vph)	165	180	39	100	221	170	35	681	25	573	789	105
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.93		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)	1495	3113		1495	2960		1495	3150		1495	1667	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1495	3113		1495	2960		1495	3150		1495	1667	1417
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	181	198	43	110	243	187	38	748	27	630	867	115
RTOR Reduction (vph)	0	19	0	0	144	0	0	2	0	0	0	49
Lane Group Flow (vph)	181	222	0	110	286	0	38	773	0	630	867	66
Heavy Vehicles (%)	8%	8%	2%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Prot
Protected Phases	7	4		3	8		5	2		1	6	6
Permitted Phases												
Actuated Green, G (s)	10.0	13.8		9.6	13.4		3.2	24.9		34.0	55.7	55.7
Effective Green, g (s)	10.0	13.8		9.6	13.4		3.2	24.9		34.0	55.7	55.7
Actuated g/C Ratio	0.10	0.14		0.10	0.14		0.03	0.25		0.35	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
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)	152	437		146	403		48	797		517	944	802
v/s Ratio Prot	c0.12	0.07		0.07	c0.10		0.03	0.25		c0.42	c0.52	0.05
v/s Ratio Perm												
v/c Ratio	1.19	0.51		0.75	0.71		0.79	0.97		1.22	0.92	0.08
Uniform Delay, d1	44.1	39.1		43.2	40.6		47.2	36.3		32.1	19.2	9.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	133.4	0.9		19.5	5.6		58.5	24.3		115.0	13.4	0.0
Delay (s)	177.6	40.0		62.7	46.2		105.7	60.6		147.1	32.7	9.7
Level of Service	F	D		E	D		F	E		F	C	A
Approach Delay (s)		99.0			49.6			62.7			75.8	
Approach LOS		F			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			71.4			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			98.3			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			91.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: Alder Ave & Base Line Rd

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	811	244	79	839	195	432	340	87	84	323	107
Future Volume (vph)	150	811	244	79	839	195	432	340	87	84	323	107
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.97		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)	1495	1609		1495	1619		1495	1616		1495	1667	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1495	1609		1495	1619		1495	1616		1495	1667	1417
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	174	943	284	92	976	227	502	395	101	98	376	124
RTOR Reduction (vph)	0	11	0	0	8	0	0	9	0	0	0	99
Lane Group Flow (vph)	174	1216	0	92	1195	0	502	487	0	98	376	25
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	7.0	43.0		4.0	40.0		17.0	31.0		6.0	20.0	20.0
Effective Green, g (s)	7.0	43.0		4.0	40.0		17.0	31.0		6.0	20.0	20.0
Actuated g/C Ratio	0.07	0.43		0.04	0.40		0.17	0.31		0.06	0.20	0.20
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)	104	691		59	647		254	500		89	333	283
v/s Ratio Prot	c0.12	c0.76		0.06	0.74		c0.34	0.30		0.07	c0.23	
v/s Ratio Perm												0.02
v/c Ratio	1.67	1.76		1.56	1.85		1.98	0.97		1.10	1.13	0.09
Uniform Delay, d1	46.5	28.5		48.0	30.0		41.5	34.1		47.0	40.0	32.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	341.1	347.9		318.8	386.8		453.3	34.3		125.4	89.0	0.6
Delay (s)	387.6	376.4		366.8	416.8		494.8	68.4		172.4	129.0	33.2
Level of Service	F	F		F	F		F	E		F	F	C
Approach Delay (s)		377.8			413.3			282.9			116.2	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			330.0			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.68									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			126.4%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Locust Ave & Casmalia St

2040 Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	30	10	5	103	24	29	173	0	7	285	272
Future Volume (vph)	133	30	10	5	103	24	29	173	0	7	285	272
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	1.00		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1697		1583	1715		1583	3353		1583	3107	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1697		1583	1715		1583	3353		1583	3107	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	32	11	5	108	25	31	182	0	7	300	286
RTOR Reduction (vph)	0	7	0	0	8	0	0	0	0	0	181	0
Lane Group Flow (vph)	140	36	0	5	125	0	31	182	0	7	406	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.1	17.5		0.5	9.9		2.1	18.2		0.6	16.7	
Effective Green, g (s)	8.1	17.5		0.5	9.9		2.1	18.2		0.6	16.7	
Actuated g/C Ratio	0.15	0.33		0.01	0.19		0.04	0.34		0.01	0.32	
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)	242	562		14	321		62	1155		17	982	
v/s Ratio Prot	c0.09	0.02		0.00	c0.07		c0.02	0.05		0.00	c0.13	
v/s Ratio Perm												
v/c Ratio	0.58	0.06		0.36	0.39		0.50	0.16		0.41	0.41	
Uniform Delay, d1	20.8	12.1		26.0	18.8		24.8	12.0		25.9	14.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.3	0.0		14.9	0.8		6.2	0.1		15.4	0.3	
Delay (s)	24.1	12.1		40.9	19.6		31.1	12.1		41.3	14.5	
Level of Service	C	B		D	B		C	B		D	B	
Approach Delay (s)		21.3			20.4			14.8			14.8	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			52.8			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			49.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

11: Locust Ave & Base Line Rd

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	304	39	21	730	143	110	20	51	34	7	46
Future Volume (vph)	160	304	39	21	730	143	110	20	51	34	7	46
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3296		1583	3269		1583	1765	1500	1583	1765	1500
Flt Permitted	0.95	1.00		0.95	1.00		0.75	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	1583	3296		1583	3269		1254	1765	1500	1238	1765	1500
Peak-hour factor, PHF	0.92	0.94	0.94	0.94	0.94	0.92	0.94	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	174	323	41	22	777	155	117	22	54	37	8	50
RTOR Reduction (vph)	0	9	0	0	16	0	0	0	44	0	0	41
Lane Group Flow (vph)	174	355	0	22	916	0	117	22	10	37	8	9
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)	13.5	41.7		1.9	30.1		12.4	12.4	12.4	12.4	12.4	12.4
Effective Green, g (s)	13.5	41.7		1.9	30.1		12.4	12.4	12.4	12.4	12.4	12.4
Actuated g/C Ratio	0.20	0.61		0.03	0.44		0.18	0.18	0.18	0.18	0.18	0.18
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)	314	2021		44	1447		228	321	273	225	321	273
v/s Ratio Prot	c0.11	0.11		0.01	c0.28			0.01			0.00	
v/s Ratio Perm							c0.09		0.01	0.03		0.01
v/c Ratio	0.55	0.18		0.50	0.63		0.51	0.07	0.04	0.16	0.02	0.03
Uniform Delay, d1	24.5	5.7		32.6	14.7		25.1	23.0	22.9	23.4	22.8	22.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.0		8.7	0.9		1.9	0.1	0.1	0.3	0.0	0.1
Delay (s)	26.7	5.7		41.2	15.6		27.0	23.1	22.9	23.8	22.9	22.9
Level of Service	C	A		D	B		C	C	C	C	C	C
Approach Delay (s)		12.5			16.2			25.4			23.3	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

12: Ayala Dr & Riverside Ave

2040 Conditions
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	499	98	201	722	124	238
Future Volume (vph)	499	98	201	722	124	238
Ideal Flow (vphpl)	1800	1800	1700	1800	1700	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	0.88
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3088		1495	3167	1495	2493
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3088		1495	3167	1495	2493
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	542	107	218	785	135	259
RTOR Reduction (vph)	18	0	0	0	0	208
Lane Group Flow (vph)	631	0	218	785	135	51
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	19.2		14.5	37.7	11.3	11.3
Effective Green, g (s)	19.2		14.5	37.7	11.3	11.3
Actuated g/C Ratio	0.34		0.25	0.66	0.20	0.20
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1040		380	2094	296	494
v/s Ratio Prot	c0.20		c0.15	0.25	c0.09	
v/s Ratio Perm						0.02
v/c Ratio	0.61		0.57	0.37	0.46	0.10
Uniform Delay, d1	15.8		18.6	4.3	20.1	18.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0		2.1	0.1	1.1	0.1
Delay (s)	16.8		20.6	4.5	21.3	18.8
Level of Service	B		C	A	C	B
Approach Delay (s)	16.8			8.0	19.6	
Approach LOS	B			A	B	
Intersection Summary						
HCM 2000 Control Delay			13.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.56			
Actuated Cycle Length (s)			57.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			48.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

13: Ayala Dr & Casmalia St

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	63	205	222	68	37	175	551	113	20	734	28
Future Volume (vph)	11	63	205	222	68	37	175	551	113	20	734	28
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		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)	1495	1667	1417	1495	1667	1417	1495	3086		1495	3149	
Flt Permitted	0.70	1.00	1.00	0.71	1.00	1.00	0.25	1.00		0.30	1.00	
Satd. Flow (perm)	1106	1667	1417	1112	1667	1417	401	3086		474	3149	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	14	78	253	274	84	46	216	680	140	25	906	35
RTOR Reduction (vph)	0	0	120	0	0	33	0	19	0	0	3	0
Lane Group Flow (vph)	14	78	133	274	84	13	216	801	0	25	938	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	24.8	24.8	24.8	24.8	24.8	24.8	52.2	52.2		52.2	52.2	
Effective Green, g (s)	24.8	24.8	24.8	24.8	24.8	24.8	52.2	52.2		52.2	52.2	
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.61	0.61		0.61	0.61	
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)	322	486	413	324	486	413	246	1895		291	1933	
v/s Ratio Prot		0.05			0.05			0.26			0.30	
v/s Ratio Perm	0.01		0.09	0.25		0.01	0.54			0.05		
v/c Ratio	0.04	0.16	0.32	0.85	0.17	0.03	0.88	0.42		0.09	0.49	
Uniform Delay, d1	21.6	22.4	23.5	28.3	22.5	21.5	13.7	8.5		6.7	9.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2	0.5	18.0	0.2	0.0	27.7	0.2		0.1	0.2	
Delay (s)	21.6	22.5	24.0	46.3	22.6	21.6	41.5	8.7		6.8	9.2	
Level of Service	C	C	C	D	C	C	D	A		A	A	
Approach Delay (s)		23.6			38.6			15.5			9.1	
Approach LOS		C			D			B			A	

Intersection Summary

HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2040 Conditions

14: Ayala Dr & I-210 WB Ramps

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	559	3	338	641	491	0	0	769	391
Future Volume (vph)	0	0	0	559	3	338	641	491	0	0	769	391
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.95	
Frt				1.00	0.97	0.85	1.00	1.00			0.95	
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1421	1417	1346	2730	3167			3007	
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1421	1417	1346	2730	3167			3007	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	0	0	658	4	398	754	578	0	0	905	460
RTOR Reduction (vph)	0	0	0	0	9	253	0	0	0	0	72	0
Lane Group Flow (vph)	0	0	0	368	353	77	754	578	0	0	1294	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				21.0	21.0	21.0	22.0	61.0			35.0	
Effective Green, g (s)				21.0	21.0	21.0	22.0	61.0			35.0	
Actuated g/C Ratio				0.23	0.23	0.23	0.24	0.68			0.39	
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)				331	330	314	667	2146			1169	
v/s Ratio Prot							c0.28	0.18			c0.43	
v/s Ratio Perm				c0.26	0.25	0.06						
v/c Ratio				1.11	1.07	0.25	1.13	0.27			1.11	
Uniform Delay, d1				34.5	34.5	28.1	34.0	5.7			27.5	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				83.1	69.1	0.4	76.6	0.1			60.6	
Delay (s)				117.6	103.6	28.5	110.6	5.8			88.1	
Level of Service				F	F	C	F	A			F	
Approach Delay (s)		0.0			85.0			65.1			88.1	
Approach LOS		A			F			E			F	
Intersection Summary												
HCM 2000 Control Delay			79.1									
HCM 2000 Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			87.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

15: Ayala Dr & I-210 EB Ramps

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	1	415	0	0	0	0	1017	336	429	903	0
Future Volume (vph)	114	1	415	0	0	0	0	1017	336	429	903	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	0.97	0.95	
Frt	1.00	0.86	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1504	1299	1346					3167	1417	3072	3167	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1504	1299	1346					3167	1417	3072	3167	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	130	1	472	0	0	0	0	1156	382	488	1026	0
RTOR Reduction (vph)	0	143	143	0	0	0	0	0	200	0	0	0
Lane Group Flow (vph)	117	102	98	0	0	0	0	1156	182	488	1026	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	12.2	12.2	12.2					37.2	37.2	16.7	57.9	
Effective Green, g (s)	12.2	12.2	12.2					37.2	37.2	16.7	57.9	
Actuated g/C Ratio	0.16	0.16	0.16					0.48	0.48	0.21	0.74	
Clearance Time (s)	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	
Lane Grp Cap (vph)	234	202	210					1508	674	656	2347	
v/s Ratio Prot								c0.37		c0.16	0.32	
v/s Ratio Perm	0.08	0.08	0.07						0.13			
v/c Ratio	0.50	0.51	0.47					0.77	0.27	0.74	0.44	
Uniform Delay, d1	30.2	30.2	30.0					16.9	12.3	28.7	3.9	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	2.0	1.7					2.4	0.2	4.6	0.1	
Delay (s)	31.8	32.2	31.6					19.3	12.5	33.3	4.0	
Level of Service	C	C	C					B	B	C	A	
Approach Delay (s)		31.9			0.0			17.6			13.4	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.2		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			78.1		Sum of lost time (s)					12.0		
Intersection Capacity Utilization			87.4%		ICU Level of Service					E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Ayala Dr & Renaissance Pkwy/Easton St

2040 Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	70	125	2	209	360	265	863	3	159	947	134
Future Volume (vph)	132	70	125	2	209	360	265	863	3	159	947	134
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.90		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1495	2863		1495	2866		1495	3167	1417	1495	3167	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1495	2863		1495	2866		1495	3167	1417	1495	3167	1417
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	150	80	142	2	238	409	301	981	3	181	1076	152
RTOR Reduction (vph)	0	102	0	0	279	0	0	0	2	0	0	99
Lane Group Flow (vph)	150	120	0	2	368	0	301	981	1	181	1076	53
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	11.0	28.3		0.8	18.1		21.0	41.7	41.7	14.8	35.5	35.5
Effective Green, g (s)	11.0	28.3		0.8	18.1		21.0	41.7	41.7	14.8	35.5	35.5
Actuated g/C Ratio	0.11	0.28		0.01	0.18		0.21	0.41	0.41	0.15	0.35	0.35
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)	161	797		11	510		309	1299	581	217	1106	495
v/s Ratio Prot	c0.10	0.04		0.00	c0.13		c0.20	0.31		0.12	c0.34	
v/s Ratio Perm									0.00			0.04
v/c Ratio	0.93	0.15		0.18	0.72		0.97	0.76	0.00	0.83	0.97	0.11
Uniform Delay, d1	44.9	27.6		50.1	39.4		40.0	25.6	17.7	42.2	32.6	22.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	50.9	0.1		7.8	5.0		43.8	2.5	0.0	23.2	20.6	0.1
Delay (s)	95.9	27.7		57.9	44.4		83.9	28.1	17.7	65.4	53.2	22.4
Level of Service	F	C		E	D		F	C	B	E	D	C
Approach Delay (s)		55.2			44.4			41.2			51.5	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			47.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			101.6			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			83.9%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

17: Cedar Ave/Ayala Dr & Base Line Rd

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	249	420	135	65	1047	47	147	611	98	30	609	190
Future Volume (vph)	249	420	135	65	1047	47	147	611	98	30	609	190
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1495	3051		1495	3146		1495	1667	1417	1495	3054	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1495	3051		1495	3146		1495	1667	1417	1495	3054	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	283	477	153	74	1190	53	167	694	111	34	692	216
RTOR Reduction (vph)	0	30	0	0	3	0	0	0	60	0	29	0
Lane Group Flow (vph)	283	600	0	74	1240	0	167	694	51	34	879	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	14.0	36.6		8.2	30.8		10.0	39.2	39.2	2.4	31.6	
Effective Green, g (s)	14.0	36.6		8.2	30.8		10.0	39.2	39.2	2.4	31.6	
Actuated g/C Ratio	0.14	0.36		0.08	0.30		0.10	0.38	0.38	0.02	0.31	
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)	204	1090		119	946		145	638	542	35	942	
v/s Ratio Prot	c0.19	0.20		0.05	c0.39		c0.11	c0.42		0.02	0.29	
v/s Ratio Perm									0.04			
v/c Ratio	1.39	0.55		0.62	1.31		1.15	1.09	0.09	0.97	0.93	
Uniform Delay, d1	44.2	26.3		45.6	35.8		46.2	31.6	20.2	50.0	34.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	201.6	0.6		9.7	147.2		121.3	61.8	0.3	140.0	17.0	
Delay (s)	245.8	26.9		55.3	183.0		167.5	93.4	20.6	190.0	51.4	
Level of Service	F	C		E	F		F	F	C	F	D	
Approach Delay (s)		94.8			175.9			97.8			56.4	
Approach LOS		F			F			F			E	
Intersection Summary												
HCM 2000 Control Delay	112.5			HCM 2000 Level of Service			F					
HCM 2000 Volume to Capacity ratio	1.25											
Actuated Cycle Length (s)	102.4			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	98.2%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

18: Cedar Ave & Foothill Blvd

2040 Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	573	148	186	920	98	152	581	156	133	820	81
Future Volume (vph)	106	573	148	186	920	98	152	581	156	133	820	81
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1495	4410		1495	4484		1495	3066		1495	3124	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1495	4410		1495	4484		1495	3066		1495	3124	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	119	644	166	209	1034	110	171	653	175	149	921	91
RTOR Reduction (vph)	0	45	0	0	13	0	0	24	0	0	8	0
Lane Group Flow (vph)	119	765	0	209	1131	0	171	804	0	149	1004	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	19.4		15.6	26.0		12.9	36.5		12.4	36.0	
Effective Green, g (s)	9.0	19.4		15.6	26.0		12.9	36.5		12.4	36.0	
Actuated g/C Ratio	0.09	0.19		0.16	0.26		0.13	0.37		0.12	0.36	
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)	134	856		233	1167		193	1120		185	1125	
v/s Ratio Prot	0.08	0.17		c0.14	c0.25		c0.11	0.26		0.10	c0.32	
v/s Ratio Perm												
v/c Ratio	0.89	0.89		0.90	0.97		0.89	0.72		0.81	0.89	
Uniform Delay, d1	45.0	39.2		41.4	36.6		42.8	27.3		42.6	30.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	45.3	11.7		32.6	19.2		34.9	4.0		21.9	10.9	
Delay (s)	90.3	50.9		73.9	55.7		77.6	31.2		64.5	41.0	
Level of Service	F	D		E	E		E	C		E	D	
Approach Delay (s)		56.0			58.5			39.2			44.0	
Approach LOS		E			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			49.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			99.9			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			77.0%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

19: Cedar Ave & Rialto Ave

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	123	181	257	232	296	173	667	248	201	880	68
Future Volume (vph)	31	123	181	257	232	296	173	667	248	201	880	68
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.92		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1495	2884		1495	2900		1495	3038		1495	3133	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1495	2884		1495	2900		1495	3038		1495	3133	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	36	145	213	302	273	348	204	785	292	236	1035	80
RTOR Reduction (vph)	0	186	0	0	232	0	0	37	0	0	6	0
Lane Group Flow (vph)	36	172	0	302	389	0	204	1040	0	236	1109	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.1	12.1		20.0	28.0		14.0	32.0		16.0	34.0	
Effective Green, g (s)	4.1	12.1		20.0	28.0		14.0	32.0		16.0	34.0	
Actuated g/C Ratio	0.04	0.13		0.21	0.29		0.15	0.33		0.17	0.35	
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)	63	363		311	844		217	1011		248	1108	
v/s Ratio Prot	0.02	0.06		c0.20	c0.13		0.14	0.34		c0.16	c0.35	
v/s Ratio Perm												
v/c Ratio	0.57	0.47		0.97	0.46		0.94	1.03		0.95	1.00	
Uniform Delay, d1	45.1	39.0		37.8	27.9		40.6	32.0		39.7	31.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.9	1.0		43.0	0.4		44.4	35.8		43.7	27.3	
Delay (s)	57.0	40.0		80.8	28.3		85.1	67.8		83.4	58.3	
Level of Service	E	D		F	C		F	E		F	E	
Approach Delay (s)		41.6			45.4			70.6			62.7	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			59.1			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			96.1			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			79.3%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

20: Cedar Ave & Merrill Ave

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	226	128	155	742	224	72	319	79	93	811	29
Future Volume (vph)	88	226	128	155	742	224	72	319	79	93	811	29
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.97		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1495	2995		1495	3056		1495	3072		1495	3150	
Flt Permitted	0.14	1.00		0.49	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	226	2995		768	3056		1495	3072		1495	3150	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	98	251	142	172	824	249	80	354	88	103	901	32
RTOR Reduction (vph)	0	78	0	0	30	0	0	20	0	0	3	0
Lane Group Flow (vph)	98	315	0	172	1043	0	80	422	0	103	930	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	41.1	41.1		41.1	41.1		6.2	29.3		8.9	32.0	
Effective Green, g (s)	41.1	41.1		41.1	41.1		6.2	29.3		8.9	32.0	
Actuated g/C Ratio	0.45	0.45		0.45	0.45		0.07	0.32		0.10	0.35	
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)	101	1348		345	1375		101	985		145	1104	
v/s Ratio Prot		0.11			0.34		0.05	0.14		c0.07	c0.30	
v/s Ratio Perm	c0.43			0.22								
v/c Ratio	0.97	0.23		0.50	0.76		0.79	0.43		0.71	0.84	
Uniform Delay, d1	24.5	15.4		17.8	21.0		41.9	24.4		40.0	27.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	79.6	0.1		1.1	2.5		33.3	0.3		15.1	6.0	
Delay (s)	104.2	15.5		18.9	23.4		75.3	24.7		55.1	33.3	
Level of Service	F	B		B	C		E	C		E	C	
Approach Delay (s)		33.2			22.8			32.5			35.5	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			29.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			91.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			77.1%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

21: Cedar Ave & Randall Ave

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	73	53	43	110	42	45	753	15	62	968	84
Future Volume (vph)	59	73	53	43	110	42	45	753	15	62	968	84
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1495	1561		1495	1667	1417	1495	3157		1495	3129	
Flt Permitted	0.68	1.00		0.67	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1074	1561		1058	1667	1417	1495	3157		1495	3129	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	62	77	56	45	116	44	47	793	16	65	1019	88
RTOR Reduction (vph)	0	28	0	0	0	38	0	1	0	0	7	0
Lane Group Flow (vph)	62	105	0	45	116	6	47	808	0	65	1100	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	7.9	7.9		7.9	7.9	7.9	4.0	30.7		4.5	31.2	
Effective Green, g (s)	7.9	7.9		7.9	7.9	7.9	4.0	30.7		4.5	31.2	
Actuated g/C Ratio	0.14	0.14		0.14	0.14	0.14	0.07	0.56		0.08	0.57	
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)	153	223		151	239	203	108	1758		122	1771	
v/s Ratio Prot		0.07			c0.07		0.03	0.26		c0.04	c0.35	
v/s Ratio Perm	0.06			0.04		0.00						
v/c Ratio	0.41	0.47		0.30	0.49	0.03	0.44	0.46		0.53	0.62	
Uniform Delay, d1	21.5	21.7		21.1	21.7	20.3	24.5	7.3		24.3	8.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	1.6		1.1	1.6	0.1	2.8	0.2		4.4	0.7	
Delay (s)	23.2	23.2		22.2	23.3	20.4	27.3	7.5		28.7	8.7	
Level of Service	C	C		C	C	C	C	A		C	A	
Approach Delay (s)		23.2			22.4			8.5			9.8	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.5				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			55.1				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			58.5%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

22: Cactus Ave/Country Club Dr & Riverside Ave

2040 Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	94	440	14	114	460	23	43	484	132	37	21	198
Future Volume (vph)	94	440	14	114	460	23	43	484	132	37	21	198
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frt	1.00	1.00		1.00	0.99		1.00	0.97			0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1583	3338		1583	3329		1583	1708			2943	
Flt Permitted	0.95	1.00		0.95	1.00		0.58	1.00			0.79	
Satd. Flow (perm)	1583	3338		1583	3329		968	1708			2343	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	478	15	124	500	25	47	526	143	40	23	215
RTOR Reduction (vph)	0	2	0	0	4	0	0	11	0	0	108	0
Lane Group Flow (vph)	102	491	0	124	521	0	47	658	0	0	170	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.4	16.7		8.4	17.7		36.6	36.6			36.6	
Effective Green, g (s)	7.4	16.7		8.4	17.7		36.6	36.6			36.6	
Actuated g/C Ratio	0.10	0.23		0.11	0.24		0.50	0.50			0.50	
Clearance Time (s)	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	
Lane Grp Cap (vph)	158	756		180	799		480	848			1163	
v/s Ratio Prot	0.06	0.15		c0.08	c0.16			c0.39				
v/s Ratio Perm							0.05				0.07	
v/c Ratio	0.65	0.65		0.69	0.65		0.10	0.78			0.15	
Uniform Delay, d1	31.9	25.8		31.4	25.2		9.8	15.2			10.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	8.7	1.9		10.5	1.9		0.1	4.5			0.1	
Delay (s)	40.6	27.8		41.9	27.1		9.9	19.7			10.1	
Level of Service	D	C		D	C		A	B			B	
Approach Delay (s)		30.0			30.0			19.0			10.1	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			24.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			73.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			71.2%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

23: Cactus Ave & Casmalia St

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	41	159	29	40	33	232	412	24	12	426	47
Future Volume (vph)	22	41	159	29	40	33	232	412	24	12	426	47
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	24	45	175	32	44	36	255	453	26	13	468	52
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	244	112	482	253	247	286						
Volume Left (vph)	24	32	255	0	13	0						
Volume Right (vph)	175	36	0	26	0	52						
Hadj (s)	-0.38	-0.10	0.30	-0.04	0.06	-0.09						
Departure Headway (s)	6.8	7.6	7.1	6.7	7.1	7.0						
Degree Utilization, x	0.46	0.24	0.94	0.47	0.49	0.55						
Capacity (veh/h)	511	442	503	526	495	493						
Control Delay (s)	15.5	12.9	52.7	14.4	15.6	17.1						
Approach Delay (s)	15.5	12.9	39.5		16.4							
Approach LOS	C	B	E		C							
Intersection Summary												
Delay			26.5									
Level of Service			D									
Intersection Capacity Utilization			59.3%	ICU Level of Service		B						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Cactus Ave & Easton St

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	85	37	74	47	109	235	201	375	44	136	402	90
Future Volume (vph)	85	37	74	47	109	235	201	375	44	136	402	90
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	91	40	80	51	117	253	216	403	47	146	432	97
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	211	421	418	249	362	313						
Volume Left (vph)	91	51	216	0	146	0						
Volume Right (vph)	80	253	0	47	0	97						
Hadj (s)	-0.11	-0.30	0.29	-0.10	0.24	-0.18						
Departure Headway (s)	9.0	7.9	9.1	8.7	8.9	8.4						
Degree Utilization, x	0.53	0.92	1.00	0.60	0.89	0.73						
Capacity (veh/h)	378	421	418	405	393	418						
Control Delay (s)	21.8	53.1	74.7	22.5	50.5	30.2						
Approach Delay (s)	21.8	53.1	55.3		41.1							
Approach LOS	C	F	F		E							
Intersection Summary												
Delay			46.4									
Level of Service			E									
Intersection Capacity Utilization			78.3%		ICU Level of Service				D			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

2040 Conditions

25: Cactus Ave & Base Line Rd

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	618	203	326	1105	134	244	547	242	117	568	155
Future Volume (vph)	99	618	203	326	1105	134	244	547	242	117	568	155
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3228		1583	3299		1583	3199		1583	3245	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3228		1583	3299		1583	3199		1583	3245	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	122	763	251	402	1364	165	301	675	299	144	701	191
RTOR Reduction (vph)	0	32	0	0	9	0	0	50	0	0	25	0
Lane Group Flow (vph)	122	982	0	402	1520	0	301	924	0	144	867	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.0	25.0		20.0	39.0		15.0	30.0		9.0	24.0	
Effective Green, g (s)	6.0	25.0		20.0	39.0		15.0	30.0		9.0	24.0	
Actuated g/C Ratio	0.06	0.25		0.20	0.39		0.15	0.30		0.09	0.24	
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)	94	807		316	1286		237	959		142	778	
v/s Ratio Prot	0.08	0.30		c0.25	c0.46		c0.19	0.29		0.09	c0.27	
v/s Ratio Perm												
v/c Ratio	1.30	1.22		1.27	1.18		1.27	0.96		1.01	1.11	
Uniform Delay, d1	47.0	37.5		40.0	30.5		42.5	34.5		45.5	38.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	192.2	108.7		145.0	90.1		150.4	21.4		79.3	68.4	
Delay (s)	239.2	146.2		185.0	120.6		192.9	55.9		124.8	106.4	
Level of Service	F	F		F	F		F	E		F	F	
Approach Delay (s)		156.2			134.0			88.2			109.0	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM 2000 Control Delay		123.0			HCM 2000 Level of Service			F				
HCM 2000 Volume to Capacity ratio		1.23										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		95.3%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

26: Cactus Ave & Foothill Blvd

2040 Conditions
AM Peak Hour

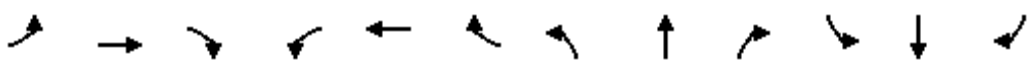
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	695	114	143	924	75	126	544	108	94	811	113
Future Volume (vph)	66	695	114	143	924	75	126	544	108	94	811	113
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total 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	0.91		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	4716		1583	3353	1500	1583	3269		1583	3292	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.18	1.00		0.30	1.00	
Satd. Flow (perm)	1583	4716		1583	3353	1500	304	3269		507	3292	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	75	790	130	162	1050	85	143	618	123	107	922	128
RTOR Reduction (vph)	0	22	0	0	0	59	0	17	0	0	11	0
Lane Group Flow (vph)	75	898	0	163	1050	26	143	724	0	107	1039	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	5.0	22.9		13.1	31.0	31.0	52.0	52.0		52.0	52.0	
Effective Green, g (s)	5.0	22.9		13.1	31.0	31.0	52.0	52.0		52.0	52.0	
Actuated g/C Ratio	0.05	0.23		0.13	0.31	0.31	0.52	0.52		0.52	0.52	
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)	79	1079		207	1039	465	158	1699		263	1711	
v/s Ratio Prot	0.05	0.19		c0.10	c0.31			0.22			0.32	
v/s Ratio Perm						0.02	c0.47			0.21		
v/c Ratio	0.95	0.83		0.79	1.01	0.06	0.91	0.43		0.41	0.61	
Uniform Delay, d1	47.4	36.7		42.1	34.5	24.2	21.8	14.8		14.6	16.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	83.1	5.6		17.7	30.6	0.1	50.0	0.8		4.6	1.6	
Delay (s)	130.5	42.3		59.8	65.1	24.3	71.8	15.6		19.2	18.4	
Level of Service	F	D		E	E	C	E	B		B	B	
Approach Delay (s)		49.0			61.7			24.7			18.5	
Approach LOS		D			E			C			B	
Intersection Summary												
HCM 2000 Control Delay			39.7									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			100.0									Sum of lost time (s) 12.0
Intersection Capacity Utilization			79.6%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

27: Cactus Ave & Rialto Ave

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	277	163	72	442	98	173	472	42	94	800	339
Future Volume (vph)	108	277	163	72	442	98	173	472	42	94	800	339
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.97		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3167		1583	3261		1583	3312		1583	3203	
Flt Permitted	0.21	1.00		0.30	1.00		0.13	1.00		0.39	1.00	
Satd. Flow (perm)	354	3167		500	3261		219	3312		646	3203	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	132	338	199	88	539	120	211	576	51	115	976	413
RTOR Reduction (vph)	0	85	0	0	19	0	0	6	0	0	30	0
Lane Group Flow (vph)	132	452	0	88	640	0	211	621	0	115	1359	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	28.0	28.0		28.0	28.0		64.0	64.0		64.0	64.0	
Effective Green, g (s)	28.0	28.0		28.0	28.0		64.0	64.0		64.0	64.0	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.64	0.64		0.64	0.64	
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)	99	886		140	913		140	2119		413	2049	
v/s Ratio Prot		0.14			0.20			0.19			0.42	
v/s Ratio Perm	c0.37			0.18			c0.96			0.18		
v/c Ratio	1.33	0.51		0.63	0.70		1.51	0.29		0.28	0.66	
Uniform Delay, d1	36.0	30.2		31.5	32.3		18.0	8.0		7.9	11.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	203.6	0.5		8.5	2.5		261.6	0.1		0.4	0.8	
Delay (s)	239.6	30.7		40.0	34.7		279.6	8.1		8.3	12.1	
Level of Service	F	C		D	C		F	A		A	B	
Approach Delay (s)		71.9			35.3			76.4			11.8	
Approach LOS		E			D			E			B	
Intersection Summary												
HCM 2000 Control Delay		41.6			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		1.45										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		81.7%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Cactus Ave & Merrill Ave

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	223	59	50	299	78	62	551	48	57	858	115
Future Volume (vph)	100	223	59	50	299	78	62	551	48	57	858	115
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		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)	1583	3248		1583	3249		1583	3313		1583	3293	
Flt Permitted	0.39	1.00		0.50	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	656	3248		836	3249		1583	3313		1583	3293	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	119	265	70	60	356	93	74	656	57	68	1021	137
RTOR Reduction (vph)	0	25	0	0	25	0	0	6	0	0	10	0
Lane Group Flow (vph)	119	310	0	60	424	0	74	707	0	68	1148	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	20.1	20.1		20.1	20.1		6.6	34.6		6.5	34.5	
Effective Green, g (s)	20.1	20.1		20.1	20.1		6.6	34.6		6.5	34.5	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.09	0.47		0.09	0.47	
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)	180	891		229	892		142	1565		140	1552	
v/s Ratio Prot		0.10			0.13		c0.05	0.21		0.04	c0.35	
v/s Ratio Perm	c0.18			0.07								
v/c Ratio	0.66	0.35		0.26	0.47		0.52	0.45		0.49	0.74	
Uniform Delay, d1	23.5	21.3		20.8	22.1		31.8	12.9		31.8	15.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.8	0.2		0.6	0.4		3.4	0.2		2.6	1.9	
Delay (s)	32.3	21.5		21.4	22.5		35.2	13.1		34.4	17.6	
Level of Service	C	C		C	C		D	B		C	B	
Approach Delay (s)		24.4			22.4			15.2			18.5	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.2			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			73.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			63.6%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Cactus Ave & Randall Ave

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	99	78	21	107	96	49	445	37	114	837	30
Future Volume (vph)	43	99	78	21	107	96	49	445	37	114	837	30
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.93		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1648		1583	1639		1583	3314		1583	3335	
Flt Permitted	0.35	1.00		0.42	1.00		0.25	1.00		0.43	1.00	
Satd. Flow (perm)	578	1648		696	1639		416	3314		719	3335	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	51	118	93	25	127	114	58	530	44	136	996	36
RTOR Reduction (vph)	0	34	0	0	39	0	0	4	0	0	2	0
Lane Group Flow (vph)	51	177	0	25	202	0	58	570	0	136	1030	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.2	15.2		15.2	15.2		60.2	60.2		60.2	60.2	
Effective Green, g (s)	15.2	15.2		15.2	15.2		60.2	60.2		60.2	60.2	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.72	0.72		0.72	0.72	
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)	105	300		126	298		300	2392		518	2407	
v/s Ratio Prot		0.11			c0.12			0.17			c0.31	
v/s Ratio Perm	0.09			0.04			0.14			0.19		
v/c Ratio	0.49	0.59		0.20	0.68		0.19	0.24		0.26	0.43	
Uniform Delay, d1	30.6	31.2		28.9	31.8		3.8	3.9		4.0	4.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.5	2.9		0.8	6.0		1.4	0.2		1.2	0.6	
Delay (s)	34.1	34.2		29.7	37.8		5.2	4.1		5.2	5.2	
Level of Service	C	C		C	D		A	A		A	A	
Approach Delay (s)		34.2			37.0			4.2			5.2	
Approach LOS		C			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			83.4			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			57.6%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 30: Cactus Ave & San Bernardino Ave

2040 Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	90	169	3	162	390	19	9	278	91	56	402	109
Future Volume (vph)	90	169	3	162	390	19	9	278	91	56	402	109
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	132	249	4	238	574	28	13	409	134	82	591	160
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	257	129	525	315	13	543	82	751				
Volume Left (vph)	132	0	238	0	13	0	82	0				
Volume Right (vph)	0	4	0	28	0	134	0	160				
Hadj (s)	0.29	0.01	0.26	-0.03	0.53	-0.14	0.53	-0.12				
Departure Headway (s)	9.8	9.5	9.2	8.9	9.7	9.0	9.5	8.9				
Degree Utilization, x	0.69	0.34	1.00	0.78	0.03	1.00	0.22	1.00				
Capacity (veh/h)	361	376	525	395	365	543	371	751				
Control Delay (s)	31.0	16.1	75.4	36.0	11.8	74.5	14.0	74.1				
Approach Delay (s)	26.0		60.6		73.0		68.1					
Approach LOS	D		F		F		F					
Intersection Summary												
Delay			60.5									
Level of Service			F									
Intersection Capacity Utilization			70.8%	ICU Level of Service					C			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

2040 Conditions

31: Cactus Ave & Valley Blvd

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 										
Traffic Volume (vph)	84	421	0	2	599	281	0	0	1	454	0	123
Future Volume (vph)	84	421	0	2	599	281	0	0	1	454	0	123
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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		1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.85		1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95		1.00
Satd. Flow (prot)	1583	3353		1583	1765	1500		1500		1583		1500
Flt Permitted	0.12	1.00		0.40	1.00	1.00		1.00		0.76		1.00
Satd. Flow (perm)	197	3353		664	1765	1500		1500		1262		1500
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	109	547	0	3	778	365	0	0	1	590	0	160
RTOR Reduction (vph)	0	0	0	0	0	118	0	1	0	0	0	81
Lane Group Flow (vph)	109	547	0	3	778	247	0	0	0	590	0	79
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	50.0	50.0		50.0	50.0	50.0		42.0		42.0		42.0
Effective Green, g (s)	50.0	50.0		50.0	50.0	50.0		42.0		42.0		42.0
Actuated g/C Ratio	0.50	0.50		0.50	0.50	0.50		0.42		0.42		0.42
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)	98	1676		332	882	750		630		530		630
v/s Ratio Prot		0.16			0.44			0.00				
v/s Ratio Perm	c0.55			0.00		0.16				c0.47		0.05
v/c Ratio	1.11	0.33		0.01	0.88	0.33		0.00		1.11		0.13
Uniform Delay, d1	25.0	14.9		12.6	22.4	15.0		16.8		29.0		17.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00		1.00
Incremental Delay, d2	124.4	0.1		0.0	10.3	0.3		0.0		73.9		0.1
Delay (s)	149.4	15.1		12.6	32.7	15.2		16.8		102.9		17.8
Level of Service	F	B		B	C	B		B		F		B
Approach Delay (s)		37.4			27.1			16.8			84.8	
Approach LOS		D			C			B			F	
Intersection Summary												
HCM 2000 Control Delay			46.7				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			83.3%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

32: Riverside Ave & I-210 WB Ramps

2040 Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	501	2	514	612	857	0	0	1034	251
Future Volume (vph)	0	0	0	501	2	514	612	857	0	0	1034	251
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.86	1.00
Frt				1.00	0.92	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1504	1440	1425	2891	3353			6071	1500
Flt Permitted				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1504	1440	1425	2891	3353			6071	1500
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	527	2	541	644	902	0	0	1088	264
RTOR Reduction (vph)	0	0	0	0	51	95	0	0	0	0	0	195
Lane Group Flow (vph)	0	0	0	369	309	246	644	902	0	0	1088	69
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				25.5	25.5	25.5	22.2	47.5			21.3	21.3
Effective Green, g (s)				25.5	25.5	25.5	22.2	47.5			21.3	21.3
Actuated g/C Ratio				0.31	0.31	0.31	0.27	0.59			0.26	0.26
Clearance Time (s)				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
Lane Grp Cap (vph)				473	453	448	792	1966			1596	394
v/s Ratio Prot							c0.22	0.27			c0.18	
v/s Ratio Perm				c0.25	0.21	0.17						0.05
v/c Ratio				0.78	0.68	0.55	0.81	0.46			0.68	0.18
Uniform Delay, d1				25.2	24.2	23.0	27.5	9.5			26.8	23.1
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				8.1	4.2	1.4	6.4	0.2			1.2	0.2
Delay (s)				33.3	28.4	24.4	33.9	9.6			28.0	23.3
Level of Service				C	C	C	C	A			C	C
Approach Delay (s)		0.0			28.8			19.7			27.1	
Approach LOS		A			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			24.7									
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			81.0									
Intersection Capacity Utilization			67.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

33: Riverside Ave & I-210 EB Ramps

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	1	320	0	0	0	0	1325	376	543	988	0
Future Volume (vph)	142	1	320	0	0	0	0	1325	376	543	988	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1600	1800	1800
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95					0.86	1.00	0.97	0.95	
Frt	1.00	0.85	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1426	1425					6071	1500	2891	3353	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1426	1425					6071	1500	2891	3353	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	1	337	0	0	0	0	1395	396	572	1040	0
RTOR Reduction (vph)	0	132	132	0	0	0	0	0	236	0	0	0
Lane Group Flow (vph)	149	38	36	0	0	0	0	1395	160	572	1040	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	12.7	12.7	12.7					30.3	30.3	20.2	54.5	
Effective Green, g (s)	12.7	12.7	12.7					30.3	30.3	20.2	54.5	
Actuated g/C Ratio	0.17	0.17	0.17					0.40	0.40	0.27	0.72	
Clearance Time (s)	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	
Lane Grp Cap (vph)	267	240	240					2446	604	776	2430	
v/s Ratio Prot		0.03						c0.23		c0.20	0.31	
v/s Ratio Perm	c0.09		0.03						0.11			
v/c Ratio	0.56	0.16	0.15					0.57	0.26	0.74	0.43	
Uniform Delay, d1	28.7	26.7	26.6					17.4	15.0	25.1	4.1	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.5	0.3	0.3					0.3	0.2	3.7	0.1	
Delay (s)	31.2	27.0	26.9					17.7	15.2	28.7	4.3	
Level of Service	C	C	C					B	B	C	A	
Approach Delay (s)		28.3			0.0			17.2			12.9	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.8									
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			75.2									
Intersection Capacity Utilization			67.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

34: Riverside Ave & Easton St

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	353	84	103	181	220	486	97	855	73	117	969	228
Future Volume (vph)	353	84	103	181	220	486	97	855	73	117	969	228
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.91		0.97	0.95	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	1618		1583	1765	1500	1583	4761		2891	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1583	1618		1583	1765	1500	1583	4761		2891	3353	1500
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	376	89	110	193	234	517	103	910	78	124	1031	243
RTOR Reduction (vph)	0	42	0	0	0	143	0	10	0	0	0	126
Lane Group Flow (vph)	376	157	0	193	234	374	103	978	0	124	1031	117
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	23.0	29.2		16.8	23.0	23.0	7.0	30.3		7.7	31.0	31.0
Effective Green, g (s)	23.0	29.2		16.8	23.0	23.0	7.0	30.3		7.7	31.0	31.0
Actuated g/C Ratio	0.23	0.29		0.17	0.23	0.23	0.07	0.30		0.08	0.31	0.31
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)	364	472		265	405	345	110	1442		222	1039	465
v/s Ratio Prot	c0.24	0.10		0.12	0.13		c0.07	0.21		0.04	c0.31	
v/s Ratio Perm						c0.25						0.08
v/c Ratio	1.03	0.33		0.73	0.58	1.08	0.94	0.68		0.56	0.99	0.25
Uniform Delay, d1	38.5	27.8		39.4	34.2	38.5	46.3	30.6		44.5	34.4	25.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	55.9	0.4		9.6	2.0	72.6	65.2	1.3		3.0	25.9	0.3
Delay (s)	94.4	28.2		49.0	36.2	111.1	111.5	31.9		47.5	60.3	26.1
Level of Service	F	C		D	D	F	F	C		D	E	C
Approach Delay (s)		71.5			79.8			39.4			53.2	
Approach LOS		E			E			D			D	
Intersection Summary												
HCM 2000 Control Delay	58.3			HCM 2000 Level of Service			E					
HCM 2000 Volume to Capacity ratio	1.02											
Actuated Cycle Length (s)	100.0			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	82.8%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: Riverside Ave & Base Line Rd

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	679	111	94	1032	106	230	405	32	204	758	58
Future Volume (vph)	76	679	111	94	1032	106	230	405	32	204	758	58
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3282		1583	4750		1583	3316		1583	3317	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3282		1583	4750		1583	3316		1583	3317	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	88	790	129	109	1200	123	267	471	37	237	881	67
RTOR Reduction (vph)	0	13	0	0	12	0	0	6	0	0	6	0
Lane Group Flow (vph)	88	906	0	109	1311	0	267	502	0	237	942	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.0	27.0		8.0	29.0		18.0	29.6		19.4	31.0	
Effective Green, g (s)	6.0	27.0		8.0	29.0		18.0	29.6		19.4	31.0	
Actuated g/C Ratio	0.06	0.27		0.08	0.29		0.18	0.30		0.19	0.31	
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)	94	886		126	1377		284	981		307	1028	
v/s Ratio Prot	0.06	c0.28		c0.07	0.28		c0.17	0.15		0.15	c0.28	
v/s Ratio Perm												
v/c Ratio	0.94	1.02		0.87	0.95		0.94	0.51		0.77	0.92	
Uniform Delay, d1	46.8	36.5		45.5	34.8		40.5	29.2		38.2	33.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	71.5	36.0		42.0	14.3		37.6	1.9		11.4	14.0	
Delay (s)	118.3	72.5		87.5	49.2		78.0	31.1		49.6	47.3	
Level of Service	F	E		F	D		E	C		D	D	
Approach Delay (s)		76.5			52.1			47.3			47.8	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			55.7			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			81.0%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

36: Riverside Ave & Foothill Blvd

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	770	102	175	906	164	167	338	103	220	659	130
Future Volume (vph)	105	770	102	175	906	164	167	338	103	220	659	130
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	4733		1583	4707		1583	3353	1500	1583	3270	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	4733		1583	4707		1583	3353	1500	1583	3270	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	113	828	110	188	974	176	180	363	111	237	709	140
RTOR Reduction (vph)	0	16	0	0	25	0	0	0	83	0	17	0
Lane Group Flow (vph)	113	922	0	188	1125	0	180	363	28	237	832	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	9.5	21.2		14.5	26.2		13.8	23.6	23.6	19.0	28.8	
Effective Green, g (s)	9.5	21.2		14.5	26.2		13.8	23.6	23.6	19.0	28.8	
Actuated g/C Ratio	0.10	0.22		0.15	0.28		0.15	0.25	0.25	0.20	0.31	
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)	159	1064		243	1307		231	839	375	318	998	
v/s Ratio Prot	0.07	0.19		c0.12	c0.24		0.11	0.11		c0.15	c0.25	
v/s Ratio Perm									0.02			
v/c Ratio	0.71	0.87		0.77	0.86		0.78	0.43	0.07	0.75	0.83	
Uniform Delay, d1	41.1	35.2		38.3	32.3		38.8	29.7	27.0	35.4	30.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.9	7.6		14.2	6.0		15.2	0.4	0.1	9.1	6.1	
Delay (s)	55.0	42.7		52.5	38.3		54.0	30.1	27.1	44.5	36.6	
Level of Service	D	D		D	D		D	C	C	D	D	
Approach Delay (s)		44.1			40.3			36.2			38.3	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			40.1			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			94.3			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			76.2%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

37: Riverside Ave & Rialto Ave

2040 Conditions

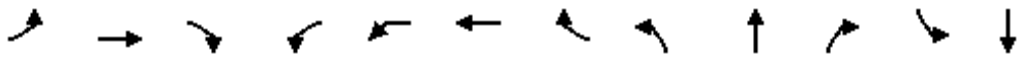
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩		↩	↩	↩	↩↪		↩	↩↪	
Traffic Volume (vph)	31	148	49	94	128	7	39	486	29	30	940	32
Future Volume (vph)	31	148	49	94	128	7	39	486	29	30	940	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.99	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1750	1500		1728	1500	1583	3325		1583	3337	
Flt Permitted		0.99	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1750	1500		1728	1500	1583	3325		1583	3337	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	35	168	56	107	145	8	44	552	33	34	1068	36
RTOR Reduction (vph)	0	0	47	0	0	7	0	4	0	0	2	0
Lane Group Flow (vph)	0	203	9	0	252	1	44	581	0	34	1102	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		14.7	14.7		17.4	17.4	2.8	42.1		3.3	42.6	
Effective Green, g (s)		14.7	14.7		17.4	17.4	2.8	42.1		3.3	42.6	
Actuated g/C Ratio		0.16	0.16		0.19	0.19	0.03	0.45		0.04	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)		275	235		321	279	47	1497		55	1520	
v/s Ratio Prot		c0.12			c0.15		c0.03	0.17		0.02	c0.33	
v/s Ratio Perm			0.01			0.00						
v/c Ratio		0.74	0.04		0.79	0.01	0.94	0.39		0.62	0.72	
Uniform Delay, d1		37.6	33.4		36.3	31.0	45.3	17.1		44.5	20.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		9.9	0.1		11.9	0.0	106.2	0.8		18.9	3.0	
Delay (s)		47.5	33.5		48.2	31.0	151.5	17.9		63.4	23.7	
Level of Service		D	C		D	C	F	B		E	C	
Approach Delay (s)		44.4			47.6			27.2			24.9	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.3									
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			93.5									
Intersection Capacity Utilization			67.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: Bloomington Ave & Riverside Ave & Merrill Ave

2040 Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	56	203	61	45	136	253	28	81	480	36	40	803
Future Volume (vph)	56	203	61	45	136	253	28	81	480	36	40	803
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95
Frt	1.00	0.97			1.00	0.99		1.00	0.99		1.00	0.96
Flt Protected	0.95	1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1583	3237			1676	3303		1676	3318		1583	3207
Flt Permitted	0.48	1.00			0.50	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	793	3237			877	3303		1676	3318		1583	3207
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	64	233	70	52	156	291	32	93	552	41	46	923
RTOR Reduction (vph)	0	0	0	0	0	8	0	0	5	0	0	2
Lane Group Flow (vph)	64	303	0	0	208	315	0	93	588	0	46	1298
Turn Type	Perm	NA		Perm	Perm	NA		Prot	NA		Prot	NA
Protected Phases		4				8		5	2		1	6
Permitted Phases	4			8	8							
Actuated Green, G (s)	24.0	24.0			24.0	24.0		6.0	41.5		4.1	39.6
Effective Green, g (s)	24.0	24.0			24.0	24.0		6.0	41.5		4.1	39.6
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.06	0.43		0.04	0.41
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)	199	812			220	829		105	1440		67	1328
v/s Ratio Prot		0.09				0.10		c0.06	0.18		0.03	c0.40
v/s Ratio Perm	0.08				c0.24							
v/c Ratio	0.32	0.37			0.95	0.38		0.89	0.41		0.69	0.98
Uniform Delay, d1	29.2	29.6			35.2	29.6		44.5	18.6		45.1	27.6
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.9	0.3			45.2	0.3		52.9	0.2		25.3	19.2
Delay (s)	30.1	29.9			80.3	29.9		97.4	18.8		70.5	46.8
Level of Service	C	C			F	C		F	B		E	D
Approach Delay (s)		29.9				49.7			29.4			47.6
Approach LOS		C				D			C			D
Intersection Summary												
HCM 2000 Control Delay			41.4									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			95.6									Sum of lost time (s) 16.0
Intersection Capacity Utilization			78.7%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
38: Bloomington Ave & Riverside Ave & Merrill Ave

2040 Conditions
AM Peak Hour



Movement	SBR	SBR2	NEL	NEL2
Lane Configurations			LT	LT
Traffic Volume (vph)	292	36	142	116
Future Volume (vph)	292	36	142	116
Ideal Flow (vphpl)	1800	1800	1800	1800
Total Lost time (s)			4.0	4.0
Lane Util. Factor			0.97	1.00
Frt			1.00	0.85
Flt Protected			0.95	1.00
Satd. Flow (prot)			3252	1500
Flt Permitted			0.95	1.00
Satd. Flow (perm)			3252	1500
Peak-hour factor, PHF	0.87	0.87	0.87	0.87
Adj. Flow (vph)	336	41	163	133
RTOR Reduction (vph)	0	0	0	119
Lane Group Flow (vph)	0	0	163	14
Turn Type			Prot	Perm
Protected Phases			9	
Permitted Phases				9
Actuated Green, G (s)			10.0	10.0
Effective Green, g (s)			10.0	10.0
Actuated g/C Ratio			0.10	0.10
Clearance Time (s)			4.0	4.0
Vehicle Extension (s)			3.0	3.0
Lane Grp Cap (vph)			340	156
v/s Ratio Prot			c0.05	
v/s Ratio Perm				0.01
v/c Ratio			0.48	0.09
Uniform Delay, d1			40.3	38.7
Progression Factor			1.00	1.00
Incremental Delay, d2			1.1	0.2
Delay (s)			41.4	38.9
Level of Service			D	D
Approach Delay (s)			40.3	
Approach LOS			D	
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

2040 Conditions

39: Riverside Ave & Randall Ave

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	124	63	186	196	62	50	385	118	37	846	71
Future Volume (vph)	28	124	63	186	196	62	50	385	118	37	846	71
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1676		1583	1701		1583	3235		1583	3314	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1676		1583	1701		1583	3235		1583	3314	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	138	70	207	218	69	56	428	131	41	940	79
RTOR Reduction (vph)	0	18	0	0	12	0	0	28	0	0	6	0
Lane Group Flow (vph)	31	190	0	207	275	0	56	531	0	41	1013	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.3	14.3		18.9	18.9		5.1	34.6		3.7	33.2	
Effective Green, g (s)	14.3	14.3		18.9	18.9		5.1	34.6		3.7	33.2	
Actuated g/C Ratio	0.16	0.16		0.22	0.22		0.06	0.40		0.04	0.38	
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)	258	273		341	367		92	1279		66	1257	
v/s Ratio Prot	0.02	c0.11		0.13	c0.16		c0.04	0.16		0.03	c0.31	
v/s Ratio Perm												
v/c Ratio	0.12	0.69		0.61	0.75		0.61	0.42		0.62	0.81	
Uniform Delay, d1	31.2	34.5		30.9	32.1		40.2	19.1		41.2	24.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	7.5		3.0	8.2		10.9	0.2		16.8	3.9	
Delay (s)	31.4	42.0		34.0	40.3		51.1	19.4		58.0	28.1	
Level of Service	C	D		C	D		D	B		E	C	
Approach Delay (s)		40.6			37.6			22.2			29.3	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			87.5			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			66.2%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

40: Riverside Ave & San Bernardino Ave

2040 Conditions
AM Peak Hour

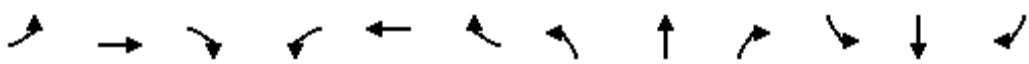
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	198	204	363	237	80	90	324	124	102	828	77
Future Volume (vph)	25	198	204	363	237	80	90	324	124	102	828	77
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total 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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1630		1583	1765	1500	1583	3214		1583	3310	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1630		1583	1765	1500	1583	3214		1583	3310	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	26	206	212	378	247	83	94	338	129	106	862	80
RTOR Reduction (vph)	0	36	0	0	0	44	0	39	0	0	7	0
Lane Group Flow (vph)	26	383	0	378	247	39	94	428	0	106	936	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	2.4	25.4		24.9	47.9	47.9	7.0	25.0		11.0	29.0	
Effective Green, g (s)	2.4	25.4		24.9	47.9	47.9	7.0	25.0		11.0	29.0	
Actuated g/C Ratio	0.02	0.25		0.24	0.47	0.47	0.07	0.24		0.11	0.28	
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)	37	404		385	826	702	108	785		170	938	
v/s Ratio Prot	0.02	c0.23		c0.24	0.14		c0.06	0.13		0.07	c0.28	
v/s Ratio Perm						0.03						
v/c Ratio	0.70	0.95		0.98	0.30	0.06	0.87	0.54		0.62	1.00	
Uniform Delay, d1	49.6	37.8		38.5	16.8	14.8	47.2	33.7		43.7	36.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	46.2	31.3		40.8	0.2	0.0	48.4	0.8		6.9	28.6	
Delay (s)	95.8	69.1		79.3	17.0	14.9	95.6	34.5		50.6	65.2	
Level of Service	F	E		E	B	B	F	C		D	E	
Approach Delay (s)		70.7			50.0			44.7			63.7	
Approach LOS		E			D			D			E	
Intersection Summary												
HCM 2000 Control Delay			57.5									
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			102.3									
Intersection Capacity Utilization			92.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

41: Riverside Ave & Valley Blvd

2040 Conditions

AM Peak Hour

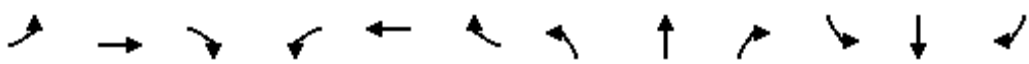
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	180	820	534	312	48	402	563	187	60	1240	34
Future Volume (vph)	35	180	820	534	312	48	402	563	187	60	1240	34
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1600	1800	1800	1700	1800	1800
Total 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	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	
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)	1583	3353	1500	1583	3353	1500	2891	4637		1583	4798	
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)	1583	3353	1500	1583	3353	1500	2891	4637		1583	4798	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	38	194	882	574	335	52	432	605	201	65	1333	37
RTOR Reduction (vph)	0	0	132	0	0	27	0	59	0	0	3	0
Lane Group Flow (vph)	38	194	750	574	335	25	432	747	0	65	1367	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.2	31.6	31.6	21.0	48.4	48.4	10.0	27.4		6.4	23.8	
Effective Green, g (s)	4.2	31.6	31.6	21.0	48.4	48.4	10.0	27.4		6.4	23.8	
Actuated g/C Ratio	0.04	0.31	0.31	0.21	0.47	0.47	0.10	0.27		0.06	0.23	
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)	64	1034	462	324	1584	708	282	1240		98	1115	
v/s Ratio Prot	0.02	0.06		c0.36	0.10		c0.15	c0.16		0.04	c0.28	
v/s Ratio Perm			c0.50			0.02						
v/c Ratio	0.59	0.19	1.62	1.77	0.21	0.03	1.53	0.60		0.66	1.23	
Uniform Delay, d1	48.3	26.0	35.4	40.7	15.8	14.5	46.2	32.7		46.9	39.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.9	0.1	290.3	359.5	0.1	0.0	256.5	0.8		15.6	109.8	
Delay (s)	62.2	26.1	325.7	400.2	15.9	14.5	302.7	33.6		62.6	149.1	
Level of Service	E	C	F	F	B	B	F	C		E	F	
Approach Delay (s)		264.5			245.4			127.5			145.2	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			188.8									
HCM 2000 Volume to Capacity ratio			1.51									
Actuated Cycle Length (s)			102.4									
Intersection Capacity Utilization			122.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

42: Riverside Ave & I-10 WB Ramps

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	820	1	205	247	952	0	0	2270	344
Future Volume (vph)	0	0	0	820	1	205	247	952	0	0	2270	344
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor				0.95	0.91	0.95	0.97	0.91			0.86	1.00
Frt				1.00	0.99	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1504	1522	1425	2891	4818			6071	1500
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1504	1522	1425	2891	4818			6071	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	891	1	223	268	1035	0	0	2467	374
RTOR Reduction (vph)	0	0	0	0	2	68	0	0	0	0	0	174
Lane Group Flow (vph)	0	0	0	454	458	133	268	1035	0	0	2467	200
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				32.5	32.5	32.5	10.0	58.0			44.0	44.0
Effective Green, g (s)				32.5	32.5	32.5	10.0	58.0			44.0	44.0
Actuated g/C Ratio				0.33	0.33	0.33	0.10	0.59			0.45	0.45
Clearance Time (s)				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
Lane Grp Cap (vph)				496	502	470	293	2836			2711	670
v/s Ratio Prot							c0.09	0.21			c0.41	
v/s Ratio Perm				c0.30	0.30	0.09						0.13
v/c Ratio				0.92	0.91	0.28	0.91	0.36			0.91	0.30
Uniform Delay, d1				31.7	31.6	24.4	43.8	10.6			25.4	17.4
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				21.5	20.9	0.3	31.1	0.1			5.0	0.3
Delay (s)				53.2	52.5	24.7	75.0	10.7			30.4	17.6
Level of Service				D	D	C	E	B			C	B
Approach Delay (s)		0.0			47.8			23.9			28.7	
Approach LOS		A			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.6									
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			98.5									
Intersection Capacity Utilization			112.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

43: Riverside Ave & I-10 EB Ramps

AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations								  		 			
Traffic Volume (vph)	316	8	601	0	0	0	0	907	302	526	2569	0	
Future Volume (vph)	316	8	601	0	0	0	0	907	302	526	2569	0	
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1600	1800	1800	
Total Lost time (s)	4.0	4.0	4.0					4.0		4.0	4.0		
Lane Util. Factor	0.95	0.91	0.95					0.91		0.97	0.95		
Frt	1.00	0.87	0.85					0.96		1.00	1.00		
Flt Protected	0.95	1.00	1.00					1.00		0.95	1.00		
Satd. Flow (prot)	1504	1388	1425					4637		2891	3353		
Flt Permitted	0.95	1.00	1.00					1.00		0.95	1.00		
Satd. Flow (perm)	1504	1388	1425					4637		2891	3353		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	347	9	660	0	0	0	0	997	332	578	2823	0	
RTOR Reduction (vph)	0	4	44	0	0	0	0	56	0	0	0	0	
Lane Group Flow (vph)	312	350	306	0	0	0	0	1273	0	578	2823	0	
Turn Type	Perm	NA	Perm					NA		Prot	NA		
Protected Phases		4						2		1	6		
Permitted Phases	4		4										
Actuated Green, G (s)	20.0	20.0	20.0					43.6		24.4	72.0		
Effective Green, g (s)	20.0	20.0	20.0					43.6		24.4	72.0		
Actuated g/C Ratio	0.20	0.20	0.20					0.44		0.24	0.72		
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)	300	277	285					2021		705	2414		
v/s Ratio Prot								0.27		0.20	c0.84		
v/s Ratio Perm	0.21	0.25	0.21										
v/c Ratio	1.04	1.26	1.07					0.63		0.82	1.17		
Uniform Delay, d1	40.0	40.0	40.0					21.9		35.7	14.0		
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00		
Incremental Delay, d2	62.7	144.2	74.3					0.6		7.4	81.1		
Delay (s)	102.7	184.2	114.3					22.5		43.1	95.1		
Level of Service	F	F	F					C		D	F		
Approach Delay (s)		135.1			0.0			22.5			86.3		
Approach LOS		F			A			C			F		
Intersection Summary													
HCM 2000 Control Delay			80.2									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.24										
Actuated Cycle Length (s)			100.0							12.0			Sum of lost time (s)
Intersection Capacity Utilization			112.4%							H			ICU Level of Service
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

44: Riverside Ave & Slover Ave

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	15	42	22	10	14	57	1113	10	36	2850	317
Future Volume (vph)	176	15	42	22	10	14	57	1113	10	36	2850	317
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.89		1.00	0.91		1.00	1.00		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)	1583	2984		1583	3055		1583	3349		1583	3303	
Flt Permitted	0.74	1.00		0.71	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1231	2984		1189	3055		1583	3349		1583	3303	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	198	17	47	25	11	16	64	1251	11	40	3202	356
RTOR Reduction (vph)	0	40	0	0	14	0	0	1	0	0	8	0
Lane Group Flow (vph)	198	24	0	25	13	0	64	1261	0	40	3550	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	16.0	16.0		16.0	16.0		4.0	77.4		4.2	77.6	
Effective Green, g (s)	16.0	16.0		16.0	16.0		4.0	77.4		4.2	77.6	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.04	0.71		0.04	0.71	
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)	179	435		173	445		57	2365		60	2338	
v/s Ratio Prot		0.01			0.00		c0.04	0.38		0.03	c1.08	
v/s Ratio Perm	c0.16			0.02								
v/c Ratio	1.11	0.05		0.14	0.03		1.12	0.53		0.67	1.52	
Uniform Delay, d1	46.8	40.3		40.8	40.1		52.8	7.6		52.0	16.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	98.6	0.1		0.4	0.0		156.9	0.2		24.5	235.6	
Delay (s)	145.4	40.3		41.2	40.2		209.7	7.8		76.6	251.6	
Level of Service	F	D		D	D		F	A		E	F	
Approach Delay (s)		119.7			40.7			17.6			249.6	
Approach LOS		F			D			B			F	
Intersection Summary												
HCM 2000 Control Delay	182.3			HCM 2000 Level of Service			F					
HCM 2000 Volume to Capacity ratio	1.43											
Actuated Cycle Length (s)	109.6			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	118.0%			ICU Level of Service			H					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

45: Riverside Ave & Jurupa Ave

2040 Conditions
AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	46	122	92	1135	2448	80
Future Volume (vph)	46	122	92	1135	2448	80
Ideal Flow (vphpl)	1700	1800	1700	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1583	1500	1583	4818	3337	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1583	1500	1583	4818	3337	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	49	130	98	1207	2604	85
RTOR Reduction (vph)	0	66	0	0	2	0
Lane Group Flow (vph)	49	64	98	1207	2687	0
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	9.1	9.1	4.0	66.1	58.1	
Effective Green, g (s)	9.1	9.1	4.0	66.1	58.1	
Actuated g/C Ratio	0.11	0.11	0.05	0.79	0.70	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	173	164	76	3827	2330	
v/s Ratio Prot	0.03		c0.06	0.25	c0.81	
v/s Ratio Perm		c0.04				
v/c Ratio	0.28	0.39	1.29	0.32	1.15	
Uniform Delay, d1	34.1	34.5	39.6	2.3	12.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	1.5	199.2	0.0	74.3	
Delay (s)	35.0	36.0	238.8	2.4	86.9	
Level of Service	C	D	F	A	F	
Approach Delay (s)	35.7			20.1	86.9	
Approach LOS	D			C	F	

Intersection Summary

HCM 2000 Control Delay	63.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

46: Riverside Ave & Agua Mansa Rd

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	192	103	180	588	88	253	946	100	94	1950	363
Future Volume (vph)	129	192	103	180	588	88	253	946	100	94	1950	363
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		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)	1583	1765	1500	1583	1765	1500	1583	3305		1583	3353	1500
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)	1583	1765	1500	1583	1765	1500	1583	3305		1583	3353	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	140	209	112	196	639	96	275	1028	109	102	2120	395
RTOR Reduction (vph)	0	0	94	0	0	72	0	8	0	0	0	81
Lane Group Flow (vph)	140	209	18	196	639	24	275	1129	0	102	2120	314
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	6.0	16.5	16.5	14.5	25.0	25.0	10.0	44.3		8.7	43.0	43.0
Effective Green, g (s)	6.0	16.5	16.5	14.5	25.0	25.0	10.0	44.3		8.7	43.0	43.0
Actuated g/C Ratio	0.06	0.16	0.16	0.14	0.25	0.25	0.10	0.44		0.09	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
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	291	247	229	441	375	158	1464		137	1441	645
v/s Ratio Prot	c0.09	0.12		0.12	c0.36		c0.17	0.34		0.06	c0.63	
v/s Ratio Perm			0.01			0.02						0.21
v/c Ratio	1.49	0.72	0.07	0.86	1.45	0.06	1.74	0.77		0.74	1.47	0.49
Uniform Delay, d1	47.0	39.5	35.3	41.7	37.5	28.6	45.0	23.6		44.6	28.5	20.5
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	268.1	8.2	0.1	25.5	214.5	0.1	358.1	2.6		19.5	215.9	0.6
Delay (s)	315.1	47.8	35.4	67.2	252.0	28.7	403.1	26.1		64.1	244.4	21.1
Level of Service	F	D	D	E	F	C	F	C		E	F	C
Approach Delay (s)		125.9			190.0			99.6			203.6	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			167.6				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.50									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			126.6%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

47: Acacia Ave & Base Line Rd

2040 Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	3	333	26	41	703	11	49	75	48	37	64	27
Future Volume (vph)	3	333	26	41	703	11	49	75	48	37	64	27
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.96			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1583	3317		1583	3345			1674			1689	
Flt Permitted	0.29	1.00		0.50	1.00			0.88			0.87	
Satd. Flow (perm)	476	3317		834	3345			1487			1488	
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	4	401	31	49	847	13	59	90	58	45	77	33
RTOR Reduction (vph)	0	6	0	0	1	0	0	16	0	0	11	0
Lane Group Flow (vph)	4	426	0	49	859	0	0	191	0	0	144	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.6	18.6		18.6	18.6			11.2			11.2	
Effective Green, g (s)	18.6	18.6		18.6	18.6			11.2			11.2	
Actuated g/C Ratio	0.49	0.49		0.49	0.49			0.30			0.30	
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)	234	1632		410	1645			440			440	
v/s Ratio Prot		0.13			c0.26							
v/s Ratio Perm	0.01			0.06				c0.13			0.10	
v/c Ratio	0.02	0.26		0.12	0.52			0.43			0.33	
Uniform Delay, d1	4.9	5.6		5.2	6.6			10.7			10.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.1		0.1	0.3			0.7			0.4	
Delay (s)	4.9	5.7		5.3	6.9			11.4			10.8	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		5.7			6.8			11.4			10.8	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		7.4			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.49										
Actuated Cycle Length (s)		37.8			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		47.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

48: Acacia Ave & Foothill Blvd

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	986	88	43	1194	45	74	123	56	58	172	72
Future Volume (vph)	34	986	88	43	1194	45	74	123	56	58	172	72
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1583	4758		1583	3335			1687			1692	
Flt Permitted	0.95	1.00		0.95	1.00			0.74			0.87	
Satd. Flow (perm)	1583	4758		1583	3335			1263			1491	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	38	1108	99	48	1342	51	83	138	63	65	193	81
RTOR Reduction (vph)	0	10	0	0	2	0	0	11	0	0	12	0
Lane Group Flow (vph)	38	1197	0	48	1391	0	0	273	0	0	327	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	2.5	40.1		3.4	41.0			23.2			23.2	
Effective Green, g (s)	2.5	40.1		3.4	41.0			23.2			23.2	
Actuated g/C Ratio	0.03	0.51		0.04	0.52			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)	50	2424		68	1737			372			439	
v/s Ratio Prot	0.02	0.25		c0.03	c0.42							
v/s Ratio Perm								0.22			c0.22	
v/c Ratio	0.76	0.49		0.71	0.80			0.73			0.74	
Uniform Delay, d1	37.8	12.6		37.2	15.5			25.0			25.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	48.9	0.2		28.3	2.7			7.3			6.7	
Delay (s)	86.8	12.8		65.4	18.2			32.3			31.8	
Level of Service	F	B		E	B			C			C	
Approach Delay (s)		15.1			19.8			32.3			31.8	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			20.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			78.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			70.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

49: Pepper Ave & Base Line Rd

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	201	212	35	401	215	211	443	12	128	566	330
Future Volume (vph)	184	201	212	35	401	215	211	443	12	128	566	330
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.95		1.00	1.00		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3095		1583	3177		1583	3340		1583	3168	
Flt Permitted	0.28	1.00		0.42	1.00		0.22	1.00		0.44	1.00	
Satd. Flow (perm)	459	3095		699	3177		366	3340		733	3168	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	200	218	230	38	436	234	229	482	13	139	615	359
RTOR Reduction (vph)	0	145	0	0	71	0	0	2	0	0	84	0
Lane Group Flow (vph)	200	303	0	38	599	0	229	493	0	139	890	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.0	37.0		37.0	37.0		55.0	55.0		55.0	55.0	
Effective Green, g (s)	37.0	37.0		37.0	37.0		55.0	55.0		55.0	55.0	
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.55	0.55		0.55	0.55	
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)	169	1145		258	1175		201	1837		403	1742	
v/s Ratio Prot		0.10			0.19			0.15			0.28	
v/s Ratio Perm	c0.44			0.05			c0.63			0.19		
v/c Ratio	1.18	0.26		0.15	0.51		1.14	0.27		0.34	0.51	
Uniform Delay, d1	31.5	22.0		21.0	24.5		22.5	11.9		12.5	14.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	127.2	0.1		0.3	0.4		106.0	0.4		2.3	1.1	
Delay (s)	158.7	22.1		21.3	24.8		128.5	12.2		14.8	15.2	
Level of Service	F	C		C	C		F	B		B	B	
Approach Delay (s)		64.3			24.6			49.0			15.1	
Approach LOS		E			C			D			B	
Intersection Summary												
HCM 2000 Control Delay			34.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			1.15									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			84.4%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

50: Pepper Ave & Foothill Blvd

2040 Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	635	249	197	740	170	152	463	113	103	631	194
Future Volume (vph)	132	635	249	197	740	170	152	463	113	103	631	194
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3353	1500	1583	3259		1583	3254		1583	3234	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.23	1.00		0.35	1.00	
Satd. Flow (perm)	1583	3353	1500	1583	3259		383	3254		591	3234	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	142	683	268	212	796	183	163	498	122	111	678	209
RTOR Reduction (vph)	0	0	130	0	20	0	0	21	0	0	29	0
Lane Group Flow (vph)	142	683	138	212	959	0	163	599	0	111	858	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	10.0	25.0	25.0	14.0	29.0		49.0	49.0		49.0	49.0	
Effective Green, g (s)	10.0	25.0	25.0	14.0	29.0		49.0	49.0		49.0	49.0	
Actuated g/C Ratio	0.10	0.25	0.25	0.14	0.29		0.49	0.49		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	
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)	158	838	375	221	945		187	1594		289	1584	
v/s Ratio Prot	0.09	0.20		c0.13	c0.29			0.18			0.27	
v/s Ratio Perm			0.09				c0.43			0.19		
v/c Ratio	0.90	0.82	0.37	0.96	1.01		0.87	0.38		0.38	0.54	
Uniform Delay, d1	44.5	35.3	31.0	42.7	35.5		22.7	15.9		16.0	17.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	42.9	6.1	0.6	48.4	33.0		39.0	0.7		3.8	1.3	
Delay (s)	87.4	41.5	31.6	91.2	68.5		61.7	16.6		19.9	19.0	
Level of Service	F	D	C	F	E		E	B		B	B	
Approach Delay (s)		45.0			72.6			26.0			19.1	
Approach LOS		D			E			C			B	
Intersection Summary												
HCM 2000 Control Delay			43.1			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			83.2%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: Sierra Ave & I-15 NB Off Ramp/I-15 NB On Ramp

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop				Stop			Stop			Stop	
Traffic Volume (vph)	163	4	81	0	0	0	0	1186	805	298	586	0
Future Volume (vph)	163	4	81	0	0	0	0	1186	805	298	586	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	168	4	84	0	0	0	0	1223	830	307	604	0
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	112	144	815	1238	508	403						
Volume Left (vph)	112	56	0	0	307	0						
Volume Right (vph)	0	84	0	830	0	0						
Hadj (s)	0.53	-0.18	0.03	-0.44	0.34	0.03						
Departure Headway (s)	9.3	8.5	7.0	6.5	7.5	7.2						
Degree Utilization, x	0.29	0.34	1.00	1.00	1.00	0.80						
Capacity (veh/h)	379	411	815	1238	508	494						
Control Delay (s)	14.8	14.7	65.0	62.6	67.3	32.2						
Approach Delay (s)	14.7		63.6		51.8							
Approach LOS	B		F		F							
Intersection Summary												
Delay			56.4									
Level of Service			F									
Intersection Capacity Utilization			105.6%	ICU Level of Service		G						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Sierra Ave & Riverside Ave

2040 Conditions

11/21/2016

																
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Sign Control	Stop			Stop				Stop			Stop					
Traffic Volume (vph)	112	307	0	13	58	724	0	928	22	353	444	33				
Future Volume (vph)	112	307	0	13	58	724	0	928	22	353	444	33				
Peak Hour Factor	0.92	0.92	0.92	0.91	0.92	0.91	0.92	0.91	0.91	0.91	0.91	0.92				
Hourly flow rate (vph)	122	334	0	14	63	796	0	1020	24	388	488	36				
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2								
Volume Total (vph)	122	334	14	859	1020	24	388	524								
Volume Left (vph)	122	0	14	0	0	0	388	0								
Volume Right (vph)	0	0	0	796	0	24	0	36								
Hadj (s)	0.53	0.03	0.53	-0.61	0.03	-0.67	0.53	-0.01								
Departure Headway (s)	10.1	9.6	10.0	8.9	9.5	8.8	9.7	9.1								
Degree Utilization, x	0.34	0.89	0.04	1.00	1.00	0.06	1.00	1.00								
Capacity (veh/h)	352	364	352	859	1020	400	388	524								
Control Delay (s)	17.1	53.8	12.2	73.9	76.7	11.2	77.4	75.1								
Approach Delay (s)	44.0		73.0		75.2		76.1									
Approach LOS	E		F		F		F									
Intersection Summary																
Delay			70.5													
Level of Service			F													
Intersection Capacity Utilization			148.7%		ICU Level of Service		H									
Analysis Period (min)			15													

HCM Signalized Intersection Capacity Analysis

3: Live Oak Ave & Riverside Ave

2040 Conditions

11/21/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	597	108	94	893	161	60
Future Volume (vph)	597	108	94	893	161	60
Ideal Flow (vphpl)	1800	1800	1700	1800	1700	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3276		1583	3353	1583	1500
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3276		1583	3353	1583	1500
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	622	112	98	930	168	62
RTOR Reduction (vph)	16	0	0	0	0	52
Lane Group Flow (vph)	719	0	98	930	168	11
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	21.7		6.9	32.6	8.8	8.8
Effective Green, g (s)	21.7		6.9	32.6	8.8	8.8
Actuated g/C Ratio	0.44		0.14	0.66	0.18	0.18
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1439		221	2212	281	267
v/s Ratio Prot	c0.22		0.06	c0.28	c0.11	
v/s Ratio Perm						0.01
v/c Ratio	0.50		0.44	0.42	0.60	0.04
Uniform Delay, d1	10.0		19.5	4.0	18.7	16.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		1.4	0.1	3.4	0.1
Delay (s)	10.2		20.9	4.1	22.1	16.9
Level of Service	B		C	A	C	B
Approach Delay (s)	10.2			5.7	20.7	
Approach LOS	B			A	C	
Intersection Summary						
HCM 2000 Control Delay			9.1		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.52			
Actuated Cycle Length (s)			49.4		Sum of lost time (s)	12.0
Intersection Capacity Utilization			46.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

4: Alder Ave & Riverside Ave

2040 Conditions

11/21/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘↗	↗
Traffic Volume (vph)	563	205	120	683	319	124
Future Volume (vph)	563	205	120	683	319	124
Ideal Flow (vphpl)	1800	1800	1700	1800	1600	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3040		1495	3167	2730	1417
Flt Permitted	1.00		0.33	1.00	0.95	1.00
Satd. Flow (perm)	3040		515	3167	2730	1417
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	574	209	122	697	326	127
RTOR Reduction (vph)	56	0	0	0	0	91
Lane Group Flow (vph)	727	0	122	697	326	36
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	18.4		18.4	18.4	10.4	10.4
Effective Green, g (s)	18.4		18.4	18.4	10.4	10.4
Actuated g/C Ratio	0.50		0.50	0.50	0.28	0.28
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1520		257	1583	771	400
v/s Ratio Prot	c0.24			0.22	c0.12	
v/s Ratio Perm			0.24			0.03
v/c Ratio	0.48		0.47	0.44	0.42	0.09
Uniform Delay, d1	6.0		6.0	5.9	10.8	9.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		1.4	0.2	0.4	0.1
Delay (s)	6.3		7.4	6.1	11.1	9.8
Level of Service	A		A	A	B	A
Approach Delay (s)	6.3			6.3	10.8	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			7.3		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.46			
Actuated Cycle Length (s)			36.8		Sum of lost time (s)	8.0
Intersection Capacity Utilization			51.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

5: Alder Ave & Sierra Lakes Pkwy/Casmalia St

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	162	137	372	150	23	71	497	299	41	385	24
Future Volume (vph)	15	162	137	372	150	23	71	497	299	41	385	24
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.93		1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1495	1552		1495	1667	1417	1495	2988		1495	3167	1417
Flt Permitted	0.66	1.00		0.52	1.00	1.00	0.45	1.00		0.17	1.00	1.00
Satd. Flow (perm)	1032	1552		825	1667	1417	710	2988		263	3167	1417
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	172	146	396	160	24	76	529	318	44	410	26
RTOR Reduction (vph)	0	33	0	0	0	11	0	88	0	0	0	17
Lane Group Flow (vph)	16	285	0	396	160	13	76	759	0	44	410	9
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	44.2	44.2		44.2	44.2	44.2	26.4	26.4		26.4	26.4	26.4
Effective Green, g (s)	44.2	44.2		44.2	44.2	44.2	26.4	26.4		26.4	26.4	26.4
Actuated g/C Ratio	0.56	0.56		0.56	0.56	0.56	0.34	0.34		0.34	0.34	0.34
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)	580	872		463	937	796	238	1003		88	1063	475
v/s Ratio Prot		0.18			0.10			0.25			0.13	
v/s Ratio Perm	0.02			0.48		0.01	0.11			0.17		0.01
v/c Ratio	0.03	0.33		0.86	0.17	0.02	0.32	0.76		0.50	0.39	0.02
Uniform Delay, d1	7.6	9.2		14.5	8.3	7.6	19.4	23.2		20.8	19.9	17.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		14.3	0.1	0.0	0.8	3.3		4.4	0.2	0.0
Delay (s)	7.7	9.4		28.8	8.4	7.6	20.2	26.5		25.2	20.1	17.5
Level of Service	A	A		C	A	A	C	C		C	C	B
Approach Delay (s)		9.4			22.3			26.0			20.5	
Approach LOS		A			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			21.5	HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			78.6	Sum of lost time (s)			8.0					
Intersection Capacity Utilization			82.2%	ICU Level of Service			E					
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: Alder Ave & I-210 WB On/I-210 WB Off

2040 Conditions

11/21/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	296	2	71	627	794	0	0	420	477
Future Volume (vph)	0	0	0	296	2	71	627	794	0	0	420	477
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		1.00	0.95			0.95	
Frt				1.00	0.85		1.00	1.00			0.92	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1495	1423		1495	3167			2914	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1495	1423		1495	3167			2914	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	312	2	75	660	836	0	0	442	502
RTOR Reduction (vph)	0	0	0	0	60	0	0	0	0	0	228	0
Lane Group Flow (vph)	0	0	0	312	17	0	660	836	0	0	716	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8								
Actuated Green, G (s)				18.0	18.0		39.0	64.0			21.0	
Effective Green, g (s)				18.0	18.0		39.0	64.0			21.0	
Actuated g/C Ratio				0.20	0.20		0.43	0.71			0.23	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				299	284		647	2252			679	
v/s Ratio Prot					0.01		c0.44	0.26			c0.25	
v/s Ratio Perm				c0.21								
v/c Ratio				1.04	0.06		1.02	0.37			1.05	
Uniform Delay, d1				36.0	29.1		25.5	5.1			34.5	
Progression Factor				1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2				63.8	0.1		40.5	0.1			49.6	
Delay (s)				99.8	29.2		66.0	5.2			84.1	
Level of Service				F	C		E	A			F	
Approach Delay (s)		0.0			85.9			32.0			84.1	
Approach LOS		A			F			C			F	
Intersection Summary												
HCM 2000 Control Delay			56.8				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			95.6%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
7: Alder Ave & SR-210 EB Off/SR-210 EB On

2040 Conditions

11/21/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↪					↩↪		↩	↩↪	
Traffic Volume (vph)	337	1	380	0	0	0	0	1084	331	146	570	0
Future Volume (vph)	337	1	380	0	0	0	0	1084	331	146	570	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.96		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1588	1354					2920		1495	3027	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1588	1354					2920		1495	3027	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	347	1	392	0	0	0	0	1118	341	151	588	0
RTOR Reduction (vph)	0	0	272	0	0	0	0	32	0	0	0	0
Lane Group Flow (vph)	0	348	120	0	0	0	0	1427	0	151	588	0
Heavy Vehicles (%)	8%	8%	13%	8%	8%	8%	8%	13%	13%	8%	13%	8%
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		20.8	20.8					45.8		10.8	60.6	
Effective Green, g (s)		20.8	20.8					45.8		10.8	60.6	
Actuated g/C Ratio		0.23	0.23					0.51		0.12	0.68	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		369	315					1495		180	2051	
v/s Ratio Prot								c0.49		c0.10	0.19	
v/s Ratio Perm		0.22	0.09									
v/c Ratio		0.94	0.38					0.95		0.84	0.29	
Uniform Delay, d1		33.7	28.9					20.8		38.4	5.8	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		32.3	0.8					13.9		27.5	0.1	
Delay (s)		66.0	29.6					34.7		65.9	5.8	
Level of Service		E	C					C		E	A	
Approach Delay (s)		46.8			0.0			34.7			18.1	
Approach LOS		D			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			33.6									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			89.4							12.0		
Intersection Capacity Utilization			95.6%									ICU Level of Service F
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Alder Ave & Renaissance Pkwy

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	296	5	60	165	520	3	742	78	249	530	156
Future Volume (vph)	154	296	5	60	165	520	3	742	78	249	530	156
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.89		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)	1495	3159		1495	2806		1495	3121		1495	1667	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1495	3159		1495	2806		1495	3121		1495	1667	1417
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	169	325	5	66	181	571	3	815	86	274	582	171
RTOR Reduction (vph)	0	1	0	0	299	0	0	8	0	0	0	80
Lane Group Flow (vph)	169	329	0	66	453	0	3	893	0	274	582	91
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Prot
Protected Phases	7	4		3	8		5	2		1	6	6
Permitted Phases												
Actuated Green, G (s)	12.7	23.4		7.3	18.0		0.8	34.7		20.0	53.9	53.9
Effective Green, g (s)	12.7	23.4		7.3	18.0		0.8	34.7		20.0	53.9	53.9
Actuated g/C Ratio	0.13	0.23		0.07	0.18		0.01	0.34		0.20	0.53	0.53
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)	187	729		107	498		11	1068		294	886	753
v/s Ratio Prot	c0.11	0.10		0.04	c0.16		0.00	c0.29		c0.18	0.35	0.06
v/s Ratio Perm												
v/c Ratio	0.90	0.45		0.62	1.04dr		0.27	0.84		0.93	0.66	0.12
Uniform Delay, d1	43.7	33.5		45.7	40.9		50.0	30.7		40.0	17.1	11.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.6	0.4		10.1	20.3		13.0	5.8		34.8	1.8	0.1
Delay (s)	83.4	33.9		55.8	61.2		63.0	36.5		74.9	18.9	12.0
Level of Service	F	C		E	E		E	D		E	B	B
Approach Delay (s)		50.7			60.7			36.6			32.7	
Approach LOS		D			E			D			C	

Intersection Summary

HCM 2000 Control Delay	43.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	101.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2040 Conditions

9: Alder Ave & Base Line Rd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	896	512	147	834	21	309	337	62	41	347	95
Future Volume (vph)	55	896	512	147	834	21	309	337	62	41	347	95
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00		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)	1495	1576		1495	1660		1495	1628		1495	1667	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1495	1576		1495	1660		1495	1628		1495	1667	1417
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	59	963	551	158	897	23	332	362	67	44	373	102
RTOR Reduction (vph)	0	21	0	0	1	0	0	6	0	0	0	81
Lane Group Flow (vph)	59	1493	0	158	919	0	332	423	0	44	373	21
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	4.0	47.0		6.0	49.0		11.0	28.6		3.2	20.8	20.8
Effective Green, g (s)	4.0	47.0		6.0	49.0		11.0	28.6		3.2	20.8	20.8
Actuated g/C Ratio	0.04	0.47		0.06	0.49		0.11	0.28		0.03	0.21	0.21
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)	59	734		88	806		163	461		47	343	292
v/s Ratio Prot	0.04	c0.95		c0.11	0.55		c0.22	0.26		0.03	c0.22	
v/s Ratio Perm												0.01
v/c Ratio	1.00	2.03		1.80	1.14		2.04	0.92		0.94	1.09	0.07
Uniform Delay, d1	48.4	26.9		47.4	25.9		44.9	34.9		48.7	40.0	32.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	117.2	470.2		399.3	77.8		487.3	25.5		106.2	74.0	0.5
Delay (s)	165.6	497.1		446.7	103.7		532.2	60.5		154.9	114.0	32.7
Level of Service	F	F		F	F		F	E		F	F	C
Approach Delay (s)		484.7			154.0			266.3			101.5	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM 2000 Control Delay	301.1			HCM 2000 Level of Service			F					
HCM 2000 Volume to Capacity ratio	1.77											
Actuated Cycle Length (s)	100.8			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	143.6%			ICU Level of Service			H					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Locust Ave & Casmalia St

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	185	17	2	92	17	30	302	7	31	330	303
Future Volume (vph)	232	185	17	2	92	17	30	302	7	31	330	303
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	1.00		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1743		1583	1724		1583	3341		1583	3112	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1743		1583	1724		1583	3341		1583	3112	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	290	231	21	2	115	21	38	378	9	39	412	379
RTOR Reduction (vph)	0	3	0	0	7	0	0	1	0	0	170	0
Lane Group Flow (vph)	290	249	0	3	129	0	38	386	0	39	622	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	19.6	30.3		0.5	11.2		3.3	22.3		3.3	22.3	
Effective Green, g (s)	19.6	30.3		0.5	11.2		3.3	22.3		3.3	22.3	
Actuated g/C Ratio	0.27	0.42		0.01	0.15		0.05	0.31		0.05	0.31	
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)	428	729		10	266		72	1029		72	958	
v/s Ratio Prot	c0.18	0.14		0.00	c0.07		0.02	0.12		c0.02	c0.20	
v/s Ratio Perm												
v/c Ratio	0.68	0.34		0.30	0.49		0.53	0.37		0.54	0.65	
Uniform Delay, d1	23.6	14.3		35.8	28.0		33.8	19.6		33.8	21.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.2	0.3		16.1	1.4		6.8	0.2		8.1	1.5	
Delay (s)	27.8	14.6		51.9	29.4		40.6	19.8		41.9	23.2	
Level of Service	C	B		D	C		D	B		D	C	
Approach Delay (s)		21.6			29.9			21.7			24.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay		23.3			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		72.4			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		54.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

11: Locust Ave & Base Line Rd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	921	130	59	525	74	71	19	27	179	36	199
Future Volume (vph)	94	921	130	59	525	74	71	19	27	179	36	199
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3291		1583	3289		1583	1765	1500	1583	1765	1500
Flt Permitted	0.95	1.00		0.95	1.00		0.73	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	1583	3291		1583	3289		1219	1765	1500	1239	1765	1500
Peak-hour factor, PHF	0.92	0.96	0.96	0.96	0.96	0.92	0.96	0.92	0.96	0.92	0.92	0.92
Adj. Flow (vph)	102	959	135	61	547	80	74	21	28	195	39	216
RTOR Reduction (vph)	0	10	0	0	11	0	0	0	20	0	0	158
Lane Group Flow (vph)	102	1084	0	61	616	0	74	21	8	195	39	58
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)	8.0	32.4		4.5	28.9		18.1	18.1	18.1	18.1	18.1	18.1
Effective Green, g (s)	8.0	32.4		4.5	28.9		18.1	18.1	18.1	18.1	18.1	18.1
Actuated g/C Ratio	0.12	0.48		0.07	0.43		0.27	0.27	0.27	0.27	0.27	0.27
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)	189	1591		106	1418		329	476	405	334	476	405
v/s Ratio Prot	c0.06	c0.33		0.04	0.19			0.01			0.02	
v/s Ratio Perm							0.06		0.01	c0.16		0.04
v/c Ratio	0.54	0.68		0.58	0.43		0.22	0.04	0.02	0.58	0.08	0.14
Uniform Delay, d1	27.8	13.3		30.3	13.3		19.0	18.1	17.9	21.2	18.2	18.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	1.2		7.4	0.2		0.3	0.0	0.0	2.6	0.1	0.2
Delay (s)	30.7	14.5		37.7	13.5		19.3	18.1	18.0	23.8	18.3	18.7
Level of Service	C	B		D	B		B	B	B	C	B	B
Approach Delay (s)		15.9			15.7			18.8			20.9	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			16.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			67.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			62.6%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: Ayala Dr & Riverside Ave

2040 Conditions

11/21/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵↵
Traffic Volume (vph)	666	104	208	484	92	212
Future Volume (vph)	666	104	208	484	92	212
Ideal Flow (vphpl)	1800	1800	1700	1800	1700	1800
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	0.88
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3103		1495	3167	1495	2493
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3103		1495	3167	1495	2493
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	724	113	226	526	100	230
RTOR Reduction (vph)	13	0	0	0	0	192
Lane Group Flow (vph)	824	0	226	526	100	38
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	24.0		15.5	43.5	10.2	10.2
Effective Green, g (s)	24.0		15.5	43.5	10.2	10.2
Actuated g/C Ratio	0.39		0.25	0.71	0.17	0.17
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1207		375	2232	247	412
v/s Ratio Prot	c0.27		c0.15	0.17	c0.07	
v/s Ratio Perm						0.02
v/c Ratio	0.68		0.60	0.24	0.40	0.09
Uniform Delay, d1	15.7		20.4	3.2	23.0	21.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6		2.7	0.1	1.1	0.1
Delay (s)	17.3		23.1	3.3	24.1	21.9
Level of Service	B		C	A	C	C
Approach Delay (s)	17.3			9.2	22.6	
Approach LOS	B			A	C	
Intersection Summary						
HCM 2000 Control Delay			15.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.60			
Actuated Cycle Length (s)			61.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			51.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

13: Ayala Dr & Casmalia St

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	115	151	107	47	18	136	649	123	3	563	21
Future Volume (vph)	59	115	151	107	47	18	136	649	123	3	563	21
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		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)	1495	1667	1417	1495	1667	1417	1495	3091		1495	3149	
Flt Permitted	0.72	1.00	1.00	0.67	1.00	1.00	0.39	1.00		0.29	1.00	
Satd. Flow (perm)	1137	1667	1417	1061	1667	1417	616	3091		455	3149	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	66	129	170	120	53	20	153	729	138	3	633	24
RTOR Reduction (vph)	0	0	123	0	0	15	0	20	0	0	3	0
Lane Group Flow (vph)	66	129	47	120	53	5	153	847	0	3	654	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	11.3	11.3	11.3	11.3	11.3	11.3	22.0	22.0		22.0	22.0	
Effective Green, g (s)	11.3	11.3	11.3	11.3	11.3	11.3	22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.53	0.53		0.53	0.53	
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)	311	456	387	290	456	387	328	1646		242	1677	
v/s Ratio Prot		0.08			0.03			0.27			0.21	
v/s Ratio Perm	0.06		0.03	0.11		0.00	0.25			0.01		
v/c Ratio	0.21	0.28	0.12	0.41	0.12	0.01	0.47	0.51		0.01	0.39	
Uniform Delay, d1	11.6	11.8	11.3	12.3	11.3	10.9	6.0	6.2		4.5	5.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.3	0.1	1.0	0.1	0.0	1.1	0.3		0.0	0.2	
Delay (s)	11.9	12.2	11.4	13.2	11.4	11.0	7.1	6.5		4.6	5.8	
Level of Service	B	B	B	B	B	B	A	A		A	A	
Approach Delay (s)		11.8			12.5			6.6			5.8	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.7									
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			41.3									
Intersection Capacity Utilization			49.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

14: Ayala Dr & I-210 WB Ramps

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	351	7	250	553	647	0	0	531	290
Future Volume (vph)	0	0	0	351	7	250	553	647	0	0	531	290
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.95	
Frt				1.00	0.96	0.85	1.00	1.00			0.95	
Flt Protected				0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1421	1403	1346	2730	3167			2999	
Flt Permitted				0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1421	1403	1346	2730	3167			2999	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	373	7	266	588	688	0	0	565	309
RTOR Reduction (vph)	0	0	0	0	16	157	0	0	0	0	83	0
Lane Group Flow (vph)	0	0	0	224	204	45	588	688	0	0	791	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				17.2	17.2	17.2	21.1	51.8			26.7	
Effective Green, g (s)				17.2	17.2	17.2	21.1	51.8			26.7	
Actuated g/C Ratio				0.22	0.22	0.22	0.27	0.67			0.35	
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)				317	313	300	748	2130			1039	
v/s Ratio Prot							c0.22	0.22			c0.26	
v/s Ratio Perm				c0.16	0.15	0.03						
v/c Ratio				0.71	0.65	0.15	0.79	0.32			0.76	
Uniform Delay, d1				27.6	27.2	24.0	25.9	5.3			22.3	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				7.0	4.8	0.2	5.5	0.1			3.3	
Delay (s)				34.6	32.0	24.3	31.3	5.4			25.7	
Level of Service				C	C	C	C	A			C	
Approach Delay (s)		0.0			30.5			17.3			25.7	
Approach LOS		A			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			23.0				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			77.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			75.3%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

15: Ayala Dr & I-210 EB Ramps

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	4	513	0	0	0	0	970	657	296	586	0
Future Volume (vph)	230	4	513	0	0	0	0	970	657	296	586	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1600	1800	1800
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.91	0.95					0.95	1.00	0.97	0.95	
Frt	1.00	0.86	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1421	1306	1346					3167	1417	2730	3167	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1421	1306	1346					3167	1417	2730	3167	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	245	4	546	0	0	0	0	1032	699	315	623	0
RTOR Reduction (vph)	0	203	221	0	0	0	0	0	362	0	0	0
Lane Group Flow (vph)	220	88	63	0	0	0	0	1032	337	315	623	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	18.0	18.0	18.0					37.2	37.2	13.4	54.6	
Effective Green, g (s)	18.0	18.0	18.0					37.2	37.2	13.4	54.6	
Actuated g/C Ratio	0.22	0.22	0.22					0.46	0.46	0.17	0.68	
Clearance Time (s)	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	
Lane Grp Cap (vph)	317	291	300					1461	654	453	2145	
v/s Ratio Prot								c0.33		c0.12	0.20	
v/s Ratio Perm	c0.15	0.07	0.05						0.24			
v/c Ratio	0.69	0.30	0.21					0.71	0.52	0.70	0.29	
Uniform Delay, d1	28.8	26.1	25.5					17.3	15.3	31.7	5.2	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.4	0.6	0.4					1.6	0.7	4.6	0.1	
Delay (s)	35.2	26.6	25.9					18.9	16.0	36.3	5.3	
Level of Service	D	C	C					B	B	D	A	
Approach Delay (s)		28.7			0.0			17.7			15.7	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.7		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			80.6		Sum of lost time (s)					12.0		
Intersection Capacity Utilization			75.3%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Ayala Dr & Renaissance Pkwy/Easton St

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	370	142	213	3	64	207	120	1051	7	338	678	33
Future Volume (vph)	370	142	213	3	64	207	120	1051	7	338	678	33
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1495	2881		1495	2803		1495	3167	1417	1495	3167	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1495	2881		1495	2803		1495	3167	1417	1495	3167	1417
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	389	149	224	3	67	218	126	1106	7	356	714	35
RTOR Reduction (vph)	0	152	0	0	192	0	0	0	5	0	0	21
Lane Group Flow (vph)	389	221	0	3	93	0	126	1106	2	356	714	14
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	20.0	30.7		0.8	11.5		11.1	30.0	30.0	18.0	36.9	36.9
Effective Green, g (s)	20.0	30.7		0.8	11.5		11.1	30.0	30.0	18.0	36.9	36.9
Actuated g/C Ratio	0.21	0.32		0.01	0.12		0.12	0.31	0.31	0.19	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
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)	313	926		12	337		173	994	445	281	1223	547
v/s Ratio Prot	c0.26	c0.08		0.00	0.03		0.08	c0.35		c0.24	0.23	
v/s Ratio Perm									0.00			0.01
v/c Ratio	1.24	0.24		0.25	0.28		0.73	1.11	0.00	1.27	0.58	0.02
Uniform Delay, d1	37.8	23.8		47.1	38.2		40.7	32.8	22.5	38.8	23.2	18.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	133.4	0.1		10.7	0.4		14.2	64.7	0.0	145.2	0.7	0.0
Delay (s)	171.1	23.9		57.7	38.7		54.9	97.5	22.5	184.0	23.9	18.2
Level of Service	F	C		E	D		D	F	C	F	C	B
Approach Delay (s)		99.1			38.9			92.7			75.3	
Approach LOS		F			D			F			E	
Intersection Summary												
HCM 2000 Control Delay			83.9			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			95.5			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			96.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

17: Cedar Ave/Ayala Dr & Base Line Rd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	398	908	134	100	631	54	143	551	178	105	630	150
Future Volume (vph)	398	908	134	100	631	54	143	551	178	105	630	150
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1495	3106		1495	3129		1495	1667	1417	1495	3075	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1495	3106		1495	3129		1495	1667	1417	1495	3075	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	402	917	135	101	637	55	144	557	180	106	636	152
RTOR Reduction (vph)	0	11	0	0	6	0	0	0	114	0	21	0
Lane Group Flow (vph)	402	1041	0	101	686	0	144	557	66	106	767	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	25.0	37.0		8.0	20.0		10.0	32.0	32.0	7.0	29.0	
Effective Green, g (s)	25.0	37.0		8.0	20.0		10.0	32.0	32.0	7.0	29.0	
Actuated g/C Ratio	0.25	0.37		0.08	0.20		0.10	0.32	0.32	0.07	0.29	
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)	373	1149		119	625		149	533	453	104	891	
v/s Ratio Prot	c0.27	0.34		0.07	c0.22		c0.10	c0.33		0.07	0.25	
v/s Ratio Perm									0.05			
v/c Ratio	1.08	0.91		0.85	1.10		0.97	1.05	0.15	1.02	0.86	
Uniform Delay, d1	37.5	29.8		45.4	40.0		44.8	34.0	24.2	46.5	33.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	68.9	10.2		39.8	65.4		63.0	51.3	0.7	93.5	10.7	
Delay (s)	106.4	40.0		85.2	105.4		107.8	85.3	24.9	140.0	44.3	
Level of Service	F	D		F	F		F	F	C	F	D	
Approach Delay (s)		58.4			102.8			76.6			55.7	
Approach LOS		E			F			E			E	
Intersection Summary												
HCM 2000 Control Delay			70.5			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			95.3%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

18: Cedar Ave & Foothill Blvd

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (vph)	166	1129	150	227	820	102	223	708	204	167	569	74
Future Volume (vph)	166	1129	150	227	820	102	223	708	204	167	569	74
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.97		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)	1495	4470		1495	4474		1495	3060		1495	3112	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1495	4470		1495	4474		1495	3060		1495	3112	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	168	1140	152	229	828	103	225	715	206	169	575	75
RTOR Reduction (vph)	0	17	0	0	15	0	0	27	0	0	10	0
Lane Group Flow (vph)	168	1275	0	229	916	0	225	894	0	169	640	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.0	27.0		15.0	28.0		16.0	31.0		11.0	26.0	
Effective Green, g (s)	14.0	27.0		15.0	28.0		16.0	31.0		11.0	26.0	
Actuated g/C Ratio	0.14	0.27		0.15	0.28		0.16	0.31		0.11	0.26	
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)	209	1206		224	1252		239	948		164	809	
v/s Ratio Prot	0.11	c0.29		c0.15	0.20		c0.15	c0.29		0.11	0.21	
v/s Ratio Perm												
v/c Ratio	0.80	1.06		1.02	0.73		0.94	0.94		1.03	0.79	
Uniform Delay, d1	41.7	36.5		42.5	32.6		41.5	33.6		44.5	34.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.6	42.5		66.0	2.2		42.1	18.3		78.5	7.8	
Delay (s)	61.3	79.0		108.5	34.8		83.7	52.0		123.0	42.2	
Level of Service	E	E		F	C		F	D		F	D	
Approach Delay (s)		77.0			49.4			58.2			58.9	
Approach LOS		E			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			62.1			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			91.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

19: Cedar Ave & Rialto Ave

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	231	205	150	133	123	179	995	127	88	779	50
Future Volume (vph)	65	231	205	150	133	123	179	995	127	88	779	50
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.93		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1495	2943		1495	2938		1495	3113		1495	3138	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1495	2943		1495	2938		1495	3113		1495	3138	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	69	246	218	160	141	131	190	1059	135	94	829	53
RTOR Reduction (vph)	0	161	0	0	103	0	0	10	0	0	4	0
Lane Group Flow (vph)	69	303	0	160	169	0	190	1184	0	94	878	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.4	14.5		13.0	20.1		15.2	42.2		6.7	33.7	
Effective Green, g (s)	7.4	14.5		13.0	20.1		15.2	42.2		6.7	33.7	
Actuated g/C Ratio	0.08	0.16		0.14	0.22		0.16	0.46		0.07	0.36	
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)	119	461		210	639		245	1421		108	1144	
v/s Ratio Prot	0.05	c0.10		c0.11	0.06		c0.13	c0.38		0.06	0.28	
v/s Ratio Perm												
v/c Ratio	0.58	0.66		0.76	0.27		0.78	0.83		0.87	0.77	
Uniform Delay, d1	41.0	36.6		38.2	30.0		37.0	22.0		42.4	25.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.7	3.4		15.0	0.2		14.2	4.4		48.4	3.1	
Delay (s)	47.7	40.0		53.2	30.2		51.2	26.4		90.8	29.0	
Level of Service	D	D		D	C		D	C		F	C	
Approach Delay (s)		41.0			38.8			29.8			35.0	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			34.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			92.4			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			75.1%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

20: Cedar Ave & Merrill Ave

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	313	45	63	230	181	54	985	49	269	802	120
Future Volume (vph)	136	313	45	63	230	181	54	985	49	269	802	120
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.93		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)	1495	3107		1495	2957		1495	3144		1495	3105	
Flt Permitted	0.38	1.00		0.43	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	600	3107		683	2957		1495	3144		1495	3105	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	142	326	47	66	240	189	56	1026	51	280	835	125
RTOR Reduction (vph)	0	12	0	0	139	0	0	4	0	0	11	0
Lane Group Flow (vph)	142	361	0	66	290	0	56	1073	0	280	949	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	24.7	24.7		24.7	24.7		6.9	37.3		20.0	50.4	
Effective Green, g (s)	24.7	24.7		24.7	24.7		6.9	37.3		20.0	50.4	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.07	0.40		0.21	0.54	
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)	157	816		179	776		109	1247		318	1664	
v/s Ratio Prot		0.12			0.10		0.04	0.34		0.19	0.31	
v/s Ratio Perm	0.24			0.10								
v/c Ratio	0.90	0.44		0.37	0.37		0.51	0.86		0.88	0.57	
Uniform Delay, d1	33.5	28.9		28.3	28.3		41.9	26.0		35.8	14.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	44.7	0.4		1.3	0.3		4.0	6.3		23.5	0.5	
Delay (s)	78.2	29.3		29.6	28.6		46.0	32.3		59.3	15.0	
Level of Service	E	C		C	C		D	C		E	B	
Approach Delay (s)		42.8			28.8			32.9			25.0	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			94.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			81.6%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

21: Cedar Ave & Randall Ave

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	127	33	19	82	70	34	976	40	93	722	48
Future Volume (vph)	82	127	33	19	82	70	34	976	40	93	722	48
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1495	1615		1495	1667	1417	1495	3148		1495	3137	
Flt Permitted	0.70	1.00		0.59	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1105	1615		922	1667	1417	1495	3148		1495	3137	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	85	131	34	20	85	72	35	1006	41	96	744	49
RTOR Reduction (vph)	0	10	0	0	0	58	0	3	0	0	5	0
Lane Group Flow (vph)	85	155	0	20	85	14	35	1044	0	96	788	0
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	12.7	12.7		12.7	12.7	12.7	2.6	32.6		7.9	37.9	
Effective Green, g (s)	12.7	12.7		12.7	12.7	12.7	2.6	32.6		7.9	37.9	
Actuated g/C Ratio	0.19	0.19		0.19	0.19	0.19	0.04	0.50		0.12	0.58	
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	314		179	324	276	59	1574		181	1823	
v/s Ratio Prot		c0.10			0.05		0.02	c0.33		c0.06	0.25	
v/s Ratio Perm	0.08			0.02		0.01						
v/c Ratio	0.40	0.49		0.11	0.26	0.05	0.59	0.66		0.53	0.43	
Uniform Delay, d1	22.9	23.4		21.6	22.3	21.3	30.8	12.2		26.9	7.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	1.2		0.3	0.4	0.1	15.0	1.1		3.0	0.2	
Delay (s)	24.1	24.6		21.9	22.7	21.4	45.8	13.3		29.9	7.8	
Level of Service	C	C		C	C	C	D	B		C	A	
Approach Delay (s)		24.4			22.1			14.3			10.2	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.4				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			65.2				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			61.4%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

22: Cactus Ave/Country Club Dr & Riverside Ave

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	849	103	82	570	34	82	36	62	43	41	30
Future Volume (vph)	24	849	103	82	570	34	82	36	62	43	41	30
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frt	1.00	0.98		1.00	0.99		1.00	0.91			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1583	3299		1583	3325		1583	1598			3162	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00			0.82	
Satd. Flow (perm)	1583	3299		1583	3325		1128	1598			2641	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	25	884	107	85	594	35	85	38	65	45	43	31
RTOR Reduction (vph)	0	9	0	0	4	0	0	56	0	0	27	0
Lane Group Flow (vph)	25	982	0	85	625	0	85	47	0	0	92	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	2.2	29.6		6.8	34.2		8.0	8.0			8.0	
Effective Green, g (s)	2.2	29.6		6.8	34.2		8.0	8.0			8.0	
Actuated g/C Ratio	0.04	0.52		0.12	0.61		0.14	0.14			0.14	
Clearance Time (s)	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	
Lane Grp Cap (vph)	61	1731		190	2016		160	226			374	
v/s Ratio Prot	0.02	c0.30		c0.05	0.19			0.03				
v/s Ratio Perm							c0.08				0.03	
v/c Ratio	0.41	0.57		0.45	0.31		0.53	0.21			0.25	
Uniform Delay, d1	26.5	9.1		23.1	5.4		22.5	21.4			21.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	4.4	0.4		1.7	0.1		3.4	0.5			0.3	
Delay (s)	30.9	9.5		24.7	5.5		25.8	21.9			21.9	
Level of Service	C	A		C	A		C	C			C	
Approach Delay (s)		10.0			7.8			23.7			21.9	
Approach LOS		B			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			11.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			56.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			55.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

23: Cactus Ave & Casmalia St

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	55	64	21	20	7	75	229	48	18	252	28
Future Volume (vph)	20	55	64	21	20	7	75	229	48	18	252	28
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	23	63	73	24	23	8	85	260	55	20	286	32
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	159	55	215	185	163	175						
Volume Left (vph)	23	24	85	0	20	0						
Volume Right (vph)	73	8	0	55	0	32						
Hadj (s)	-0.21	0.03	0.23	-0.17	0.10	-0.09						
Departure Headway (s)	5.5	5.9	5.8	5.4	5.7	5.5						
Degree Utilization, x	0.24	0.09	0.34	0.28	0.26	0.27						
Capacity (veh/h)	604	539	603	646	603	625						
Control Delay (s)	10.2	9.5	10.6	9.2	9.5	9.3						
Approach Delay (s)	10.2	9.5	9.9		9.4							
Approach LOS	B	A	A		A							
Intersection Summary												
Delay			9.8									
Level of Service			A									
Intersection Capacity Utilization			38.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Cactus Ave & Easton St

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	29	187	168	30	72	51	112	276	31	71	238	29
Future Volume (vph)	29	187	168	30	72	51	112	276	31	71	238	29
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	31	199	179	32	77	54	119	294	33	76	253	31
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	409	163	266	180	203	158						
Volume Left (vph)	31	32	119	0	76	0						
Volume Right (vph)	179	54	0	33	0	31						
Hadj (s)	-0.21	-0.13	0.26	-0.09	0.22	-0.10						
Departure Headway (s)	6.4	7.2	7.5	7.2	7.7	7.3						
Degree Utilization, x	0.73	0.33	0.56	0.36	0.43	0.32						
Capacity (veh/h)	531	433	451	476	441	459						
Control Delay (s)	24.9	13.7	18.4	13.0	15.2	12.6						
Approach Delay (s)	24.9	13.7	16.2		14.0							
Approach LOS	C	B	C		B							
Intersection Summary												
Delay			17.9									
Level of Service			C									
Intersection Capacity Utilization			58.0%	ICU Level of Service		B						
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

2040 Conditions

25: Cactus Ave & Base Line Rd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	801	331	230	527	45	220	374	265	74	396	70
Future Volume (vph)	74	801	331	230	527	45	220	374	265	74	396	70
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.99		1.00	0.94		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)	1583	3206		1583	3314		1583	3144		1583	3278	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3206		1583	3314		1583	3144		1583	3278	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	80	861	356	247	567	48	237	402	285	80	426	75
RTOR Reduction (vph)	0	45	0	0	6	0	0	125	0	0	14	0
Lane Group Flow (vph)	80	1172	0	247	609	0	237	562	0	80	487	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.2	36.8		16.0	44.6		16.0	26.4		6.4	16.8	
Effective Green, g (s)	8.2	36.8		16.0	44.6		16.0	26.4		6.4	16.8	
Actuated g/C Ratio	0.08	0.36		0.16	0.44		0.16	0.26		0.06	0.17	
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)	127	1161		249	1454		249	816		99	542	
v/s Ratio Prot	0.05	c0.37		c0.16	0.18		c0.15	0.18		0.05	c0.15	
v/s Ratio Perm												
v/c Ratio	0.63	1.01		0.99	0.42		0.95	0.69		0.81	0.90	
Uniform Delay, d1	45.2	32.4		42.7	19.6		42.4	33.9		47.0	41.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.4	28.8		54.6	0.2		43.6	4.7		36.6	20.3	
Delay (s)	54.6	61.2		97.3	19.8		86.0	38.6		83.6	61.9	
Level of Service	D	E		F	B		F	D		F	E	
Approach Delay (s)		60.8			42.0			50.8			64.9	
Approach LOS		E			D			D			E	
Intersection Summary												
HCM 2000 Control Delay			54.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			101.6			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			89.7%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

26: Cactus Ave & Foothill Blvd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	1156	129	124	821	141	191	774	188	107	677	89
Future Volume (vph)	156	1156	129	124	821	141	191	774	188	107	677	89
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.91		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	4745		1583	3353	1500	1583	3255		1583	3294	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.28	1.00		0.20	1.00	
Satd. Flow (perm)	1583	4745		1583	3353	1500	464	3255		330	3294	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	161	1192	133	128	846	145	197	798	194	110	698	92
RTOR Reduction (vph)	0	14	0	0	0	105	0	21	0	0	10	0
Lane Group Flow (vph)	161	1311	0	128	846	40	197	971	0	110	780	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	11.0	28.0		9.0	26.0	26.0	51.0	51.0		51.0	51.0	
Effective Green, g (s)	11.0	28.0		9.0	26.0	26.0	51.0	51.0		51.0	51.0	
Actuated g/C Ratio	0.11	0.28		0.09	0.26	0.26	0.51	0.51		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	
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)	174	1328		142	871	390	236	1660		168	1679	
v/s Ratio Prot	c0.10	c0.28		0.08	0.25			0.30			0.24	
v/s Ratio Perm						0.03	c0.42			0.33		
v/c Ratio	0.93	0.99		0.90	0.97	0.10	0.83	0.58		0.65	0.46	
Uniform Delay, d1	44.1	35.8		45.1	36.6	28.1	20.9	17.1		18.0	15.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	46.7	21.5		47.2	23.6	0.1	28.0	1.5		18.2	0.9	
Delay (s)	90.8	57.3		92.2	60.2	28.2	48.9	18.6		36.2	16.7	
Level of Service	F	E		F	E	C	D	B		D	B	
Approach Delay (s)		60.9			59.7			23.6			19.0	
Approach LOS		E			E			C			B	
Intersection Summary												
HCM 2000 Control Delay			43.2									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			100.0									Sum of lost time (s) 12.0
Intersection Capacity Utilization			83.2%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

27: Cactus Ave & Rialto Ave

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	327	121	46	216	90	110	842	80	106	677	74
Future Volume (vph)	82	327	121	46	216	90	110	842	80	106	677	74
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3217		1583	3205		1583	3309		1583	3303	
Flt Permitted	0.56	1.00		0.44	1.00		0.32	1.00		0.25	1.00	
Satd. Flow (perm)	931	3217		741	3205		539	3309		411	3303	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	85	341	126	48	225	94	115	877	83	110	705	77
RTOR Reduction (vph)	0	36	0	0	44	0	0	10	0	0	11	0
Lane Group Flow (vph)	85	431	0	48	275	0	115	950	0	110	771	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.8	12.8		12.8	12.8		23.9	23.9		23.9	23.9	
Effective Green, g (s)	12.8	12.8		12.8	12.8		23.9	23.9		23.9	23.9	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.53	0.53		0.53	0.53	
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)	266	921		212	917		288	1769		219	1766	
v/s Ratio Prot		c0.13			0.09			c0.29			0.23	
v/s Ratio Perm	0.09			0.06			0.21			0.27		
v/c Ratio	0.32	0.47		0.23	0.30		0.40	0.54		0.50	0.44	
Uniform Delay, d1	12.5	13.1		12.2	12.5		6.2	6.8		6.6	6.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.4		0.5	0.2		0.9	0.3		1.8	0.2	
Delay (s)	13.2	13.5		12.7	12.6		7.1	7.1		8.4	6.5	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		13.5			12.6			7.1			6.7	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.9			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			44.7			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			64.1%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

28: Cactus Ave & Merrill Ave

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	357	88	45	242	59	50	849	32	60	689	97
Future Volume (vph)	138	357	88	45	242	59	50	849	32	60	689	97
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		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)	1583	3253		1583	3254		1583	3335		1583	3291	
Flt Permitted	0.54	1.00		0.40	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	901	3253		671	3254		1583	3335		1583	3291	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	147	380	94	48	257	63	53	903	34	64	733	103
RTOR Reduction (vph)	0	23	0	0	23	0	0	3	0	0	11	0
Lane Group Flow (vph)	147	451	0	48	297	0	53	934	0	64	825	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	19.5	19.5		19.5	19.5		3.8	28.1		4.5	28.8	
Effective Green, g (s)	19.5	19.5		19.5	19.5		3.8	28.1		4.5	28.8	
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.06	0.44		0.07	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)	274	989		204	989		93	1461		111	1478	
v/s Ratio Prot		0.14			0.09		0.03	c0.28		c0.04	0.25	
v/s Ratio Perm	c0.16			0.07								
v/c Ratio	0.54	0.46		0.24	0.30		0.57	0.64		0.58	0.56	
Uniform Delay, d1	18.5	18.0		16.7	17.1		29.4	14.0		28.9	13.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.3		0.6	0.2		7.8	0.9		7.1	0.5	
Delay (s)	20.6	18.4		17.3	17.2		37.1	15.0		35.9	13.4	
Level of Service	C	B		B	B		D	B		D	B	
Approach Delay (s)		18.9			17.3			16.2			15.0	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			64.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			60.5%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Cactus Ave & Randall Ave

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	85	28	51	118	59	50	781	60	64	771	15
Future Volume (vph)	7	85	28	51	118	59	50	781	60	64	771	15
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1699		1583	1677		1583	3317		1583	3343	
Flt Permitted	0.43	1.00		0.62	1.00		0.32	1.00		0.30	1.00	
Satd. Flow (perm)	715	1699		1034	1677		530	3317		494	3343	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	8	91	30	55	127	63	54	840	65	69	829	16
RTOR Reduction (vph)	0	14	0	0	22	0	0	4	0	0	1	0
Lane Group Flow (vph)	8	107	0	55	168	0	54	901	0	69	844	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.7	13.7		13.7	13.7		63.9	63.9		63.9	63.9	
Effective Green, g (s)	13.7	13.7		13.7	13.7		63.9	63.9		63.9	63.9	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.75	0.75		0.75	0.75	
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)	114	271		165	268		395	2476		368	2495	
v/s Ratio Prot		0.06			c0.10			c0.27			0.25	
v/s Ratio Perm	0.01			0.05			0.10			0.14		
v/c Ratio	0.07	0.39		0.33	0.63		0.14	0.36		0.19	0.34	
Uniform Delay, d1	30.5	32.2		31.9	33.6		3.1	3.8		3.2	3.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.9		1.2	4.5		0.7	0.4		1.1	0.4	
Delay (s)	30.8	33.2		33.1	38.1		3.8	4.2		4.3	4.0	
Level of Service	C	C		C	D		A	A		A	A	
Approach Delay (s)		33.0			37.0			4.2			4.1	
Approach LOS		C			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.4			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			85.6			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			49.1%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Cactus Ave & San Bernardino Ave

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	108	437	6	59	287	72	2	426	90	101	356	65
Future Volume (vph)	108	437	6	59	287	72	2	426	90	101	356	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	117	475	7	64	312	78	2	463	98	110	387	71
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total (vph)	355	245	220	234	2	561	110	458				
Volume Left (vph)	117	0	64	0	2	0	110	0				
Volume Right (vph)	0	7	0	78	0	98	0	71				
Hadj (s)	0.20	0.01	0.18	-0.20	0.53	-0.09	0.53	-0.07				
Departure Headway (s)	9.2	9.0	9.4	9.1	9.6	9.0	9.4	8.8				
Degree Utilization, x	0.91	0.61	0.58	0.59	0.01	1.00	0.29	1.00				
Capacity (veh/h)	379	389	370	386	367	561	376	458				
Control Delay (s)	54.6	24.1	23.3	23.1	11.4	74.3	15.0	73.7				
Approach Delay (s)	42.1		23.2		74.1		62.3					
Approach LOS	E		C		F		F					
Intersection Summary												
Delay			51.7									
Level of Service			F									
Intersection Capacity Utilization			77.9%	ICU Level of Service		D						
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

2040 Conditions

31: Cactus Ave & Valley Blvd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	602	5	2	457	405	3	1	7	386	1	69
Future Volume (vph)	99	602	5	2	457	405	3	1	7	386	1	69
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		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)	1583	3353	1500	1583	1765	1500	1583	1529		1583	1765	1500
Flt Permitted	0.29	1.00	1.00	0.32	1.00	1.00	0.76	1.00		0.75	1.00	1.00
Satd. Flow (perm)	486	3353	1500	539	1765	1500	1262	1529		1253	1765	1500
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	110	669	6	2	508	450	3	1	8	429	1	77
RTOR Reduction (vph)	0	0	3	0	0	225	0	4	0	0	0	42
Lane Group Flow (vph)	110	669	3	2	508	225	3	5	0	429	1	35
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	28.0	28.0	28.0	28.0	28.0	28.0	29.8	29.8		29.8	29.8	29.8
Effective Green, g (s)	28.0	28.0	28.0	28.0	28.0	28.0	29.8	29.8		29.8	29.8	29.8
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.45	0.45		0.45	0.45	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	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)	206	1426	638	229	751	638	571	692		567	799	679
v/s Ratio Prot		0.20			c0.29			0.00			0.00	
v/s Ratio Perm	0.23		0.00	0.00		0.15	0.00			c0.34		0.02
v/c Ratio	0.53	0.47	0.00	0.01	0.68	0.35	0.01	0.01		0.76	0.00	0.05
Uniform Delay, d1	14.0	13.6	10.9	10.9	15.2	12.8	9.9	9.9		15.0	9.9	10.1
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	2.6	0.2	0.0	0.0	2.4	0.3	0.0	0.0		5.7	0.0	0.0
Delay (s)	16.7	13.8	10.9	10.9	17.7	13.1	9.9	9.9		20.7	9.9	10.1
Level of Service	B	B	B	B	B	B	A	A		C	A	B
Approach Delay (s)		14.2			15.5			9.9			19.1	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			15.8									
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			65.8									
Intersection Capacity Utilization			72.1%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

32: Riverside Ave & I-210 WB Ramps

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	449	2	423	450	815	0	0	1131	218
Future Volume (vph)	0	0	0	449	2	423	450	815	0	0	1131	218
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95			0.86	1.00
Frt				1.00	0.92	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1504	1449	1425	2891	3353			6071	1500
Flt Permitted				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1504	1449	1425	2891	3353			6071	1500
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	463	2	436	464	840	0	0	1166	225
RTOR Reduction (vph)	0	0	0	0	43	113	0	0	0	0	0	154
Lane Group Flow (vph)	0	0	0	315	260	170	464	840	0	0	1166	71
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				22.9	22.9	22.9	17.4	45.3			23.9	23.9
Effective Green, g (s)				22.9	22.9	22.9	17.4	45.3			23.9	23.9
Actuated g/C Ratio				0.30	0.30	0.30	0.23	0.59			0.31	0.31
Clearance Time (s)				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
Lane Grp Cap (vph)				451	435	428	660	1993			1904	470
v/s Ratio Prot							c0.16	0.25			c0.19	
v/s Ratio Perm				c0.21	0.18	0.12						0.05
v/c Ratio				0.70	0.60	0.40	0.70	0.42			0.61	0.15
Uniform Delay, d1				23.6	22.7	21.2	27.0	8.4			22.2	18.8
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				4.7	2.2	0.6	3.4	0.1			0.6	0.1
Delay (s)				28.3	24.9	21.8	30.4	8.5			22.8	19.0
Level of Service				C	C	C	C	A			C	B
Approach Delay (s)		0.0			25.1			16.3			22.2	
Approach LOS		A			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			20.8									
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			76.2									
Intersection Capacity Utilization			66.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

33: Riverside Ave & I-210 EB Ramps

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  		  	  	
Traffic Volume (vph)	211	1	435	0	0	0	0	1053	394	534	1041	0
Future Volume (vph)	211	1	435	0	0	0	0	1053	394	534	1041	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1600	1800	1800
Total Lost time (s)	4.0	4.0	4.0					4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95					0.86	1.00	0.97	0.95	
Frt	1.00	0.85	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1426	1425					6071	1500	2891	3353	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1426	1425					6071	1500	2891	3353	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	215	1	444	0	0	0	0	1074	402	545	1062	0
RTOR Reduction (vph)	0	100	100	0	0	0	0	0	264	0	0	0
Lane Group Flow (vph)	215	123	122	0	0	0	0	1074	138	545	1062	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	16.3	16.3	16.3					24.9	24.9	19.2	48.1	
Effective Green, g (s)	16.3	16.3	16.3					24.9	24.9	19.2	48.1	
Actuated g/C Ratio	0.23	0.23	0.23					0.34	0.34	0.27	0.66	
Clearance Time (s)	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	
Lane Grp Cap (vph)	356	321	320					2087	515	766	2227	
v/s Ratio Prot		0.09						0.18		c0.19	c0.32	
v/s Ratio Perm	c0.14		0.09						0.09			
v/c Ratio	0.60	0.38	0.38					0.51	0.27	0.71	0.48	
Uniform Delay, d1	25.2	23.8	23.8					18.9	17.2	24.1	6.0	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.9	0.8	0.8					0.2	0.3	3.1	0.2	
Delay (s)	28.0	24.6	24.5					19.1	17.4	27.2	6.1	
Level of Service	C	C	C					B	B	C	A	
Approach Delay (s)		25.7			0.0			18.7			13.3	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.6									
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			72.4									
Intersection Capacity Utilization			66.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

34: Riverside Ave & Easton St

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	297	191	55	142	118	233	102	910	199	360	924	194
Future Volume (vph)	297	191	55	142	118	233	102	910	199	360	924	194
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.91		0.97	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	1706		1583	1765	1500	1583	4688		2891	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1583	1706		1583	1765	1500	1583	4688		2891	3353	1500
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	303	195	56	145	120	238	104	929	203	367	943	198
RTOR Reduction (vph)	0	10	0	0	0	208	0	33	0	0	0	105
Lane Group Flow (vph)	303	241	0	145	120	30	104	1099	0	367	943	93
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	21.0	19.5		13.1	11.6	11.6	7.5	27.6		14.9	35.0	35.0
Effective Green, g (s)	21.0	19.5		13.1	11.6	11.6	7.5	27.6		14.9	35.0	35.0
Actuated g/C Ratio	0.23	0.21		0.14	0.13	0.13	0.08	0.30		0.16	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
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)	364	365		227	224	190	130	1420		472	1288	576
v/s Ratio Prot	c0.19	c0.14		0.09	0.07		0.07	0.23		c0.13	c0.28	
v/s Ratio Perm						0.02						0.06
v/c Ratio	0.83	0.66		0.64	0.54	0.16	0.80	0.77		0.78	0.73	0.16
Uniform Delay, d1	33.4	32.8		36.8	37.2	35.4	41.1	28.9		36.5	24.0	18.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.9	4.3		5.8	2.5	0.4	28.6	2.7		7.9	2.2	0.1
Delay (s)	48.3	37.0		42.6	39.7	35.8	69.6	31.6		44.4	26.2	18.6
Level of Service	D	D		D	D	D	E	C		D	C	B
Approach Delay (s)		43.2			38.7			34.8			29.6	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			34.5									
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			91.1									
Intersection Capacity Utilization			73.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

35: Riverside Ave & Base Line Rd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	861	128	190	742	125	163	533	119	191	614	67
Future Volume (vph)	155	861	128	190	742	125	163	533	119	191	614	67
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3288		1583	4713		1583	3261		1583	3304	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3288		1583	4713		1583	3261		1583	3304	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	160	888	132	196	765	129	168	549	123	197	633	69
RTOR Reduction (vph)	0	12	0	0	23	0	0	19	0	0	8	0
Lane Group Flow (vph)	160	1008	0	196	871	0	168	653	0	197	694	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.6	32.0		13.8	31.2		12.0	24.1		13.9	26.0	
Effective Green, g (s)	14.6	32.0		13.8	31.2		12.0	24.1		13.9	26.0	
Actuated g/C Ratio	0.15	0.32		0.14	0.31		0.12	0.24		0.14	0.26	
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)	231	1054		218	1473		190	787		220	860	
v/s Ratio Prot	0.10	c0.31		c0.12	0.18		0.11	0.20		c0.12	c0.21	
v/s Ratio Perm												
v/c Ratio	0.69	0.96		0.90	0.59		0.88	0.83		0.90	0.81	
Uniform Delay, d1	40.5	33.2		42.3	28.9		43.2	35.9		42.2	34.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.7	18.0		34.5	0.6		35.0	9.9		33.7	8.0	
Delay (s)	49.1	51.3		76.8	29.6		78.2	45.8		75.9	42.6	
Level of Service	D	D		E	C		E	D		E	D	
Approach Delay (s)		51.0			38.1			52.3			49.9	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			47.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			99.8			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			85.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

36: Riverside Ave & Foothill Blvd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	985	132	144	874	213	207	620	201	290	508	120
Future Volume (vph)	190	985	132	144	874	213	207	620	201	290	508	120
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	4732		1583	4676		1583	3353	1500	1583	3257	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	4732		1583	4676		1583	3353	1500	1583	3257	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	194	1005	135	147	892	217	211	633	205	296	518	122
RTOR Reduction (vph)	0	17	0	0	41	0	0	0	137	0	20	0
Lane Group Flow (vph)	194	1123	0	147	1068	0	211	633	68	296	620	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	14.3	27.0		12.1	24.8		15.8	21.3	21.3	20.7	26.2	
Effective Green, g (s)	14.3	27.0		12.1	24.8		15.8	21.3	21.3	20.7	26.2	
Actuated g/C Ratio	0.15	0.28		0.12	0.26		0.16	0.22	0.22	0.21	0.27	
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)	233	1315		197	1194		257	735	329	337	878	
v/s Ratio Prot	c0.12	c0.24		0.09	0.23		0.13	c0.19		c0.19	0.19	
v/s Ratio Perm									0.05			
v/c Ratio	0.83	0.85		0.75	0.89		0.82	0.86	0.21	0.88	0.71	
Uniform Delay, d1	40.2	33.2		41.0	34.9		39.3	36.5	31.0	37.0	32.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	21.7	5.6		14.2	8.9		18.6	10.1	0.3	21.8	2.6	
Delay (s)	62.0	38.8		55.3	43.8		57.9	46.6	31.3	58.8	34.6	
Level of Service	E	D		E	D		E	D	C	E	C	
Approach Delay (s)		42.1			45.1			45.9			42.2	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			43.8			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			97.1			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			84.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

37: Riverside Ave & Rialto Ave

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↱	↰↱		↱	↰↱	
Traffic Volume (vph)	89	157	84	65	152	33	94	966	78	55	665	34
Future Volume (vph)	89	157	84	65	152	33	94	966	78	55	665	34
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.98	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1733	1500		1739	1500	1583	3315		1583	3329	
Flt Permitted		0.98	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1733	1500		1739	1500	1583	3315		1583	3329	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	93	164	88	68	158	34	98	1006	81	57	693	35
RTOR Reduction (vph)	0	0	72	0	0	28	0	6	0	0	3	0
Lane Group Flow (vph)	0	257	16	0	226	6	98	1081	0	57	725	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		17.5	17.5		15.8	15.8	8.9	40.5		4.6	36.2	
Effective Green, g (s)		17.5	17.5		15.8	15.8	8.9	40.5		4.6	36.2	
Actuated g/C Ratio		0.19	0.19		0.17	0.17	0.09	0.43		0.05	0.38	
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)		321	278		291	251	149	1422		77	1276	
v/s Ratio Prot		c0.15			c0.13		c0.06	c0.33		0.04	0.22	
v/s Ratio Perm			0.01			0.00						
v/c Ratio		0.80	0.06		0.78	0.02	0.66	0.76		0.74	0.57	
Uniform Delay, d1		36.8	31.7		37.6	32.8	41.3	22.8		44.3	22.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		13.3	0.1		12.2	0.0	10.0	3.9		31.3	1.8	
Delay (s)		50.1	31.8		49.8	32.9	51.3	26.7		75.6	24.8	
Level of Service		D	C		D	C	D	C		E	C	
Approach Delay (s)		45.4			47.6			28.7			28.5	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			32.8									
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			94.4									
Intersection Capacity Utilization			73.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: Bloomington Ave & Riverside Ave & Merrill Ave

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	35	155	103	43	259	61	3	136	995	45	10	163
Future Volume (vph)	35	155	103	43	259	61	3	136	995	45	10	163
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95
Frt	1.00	0.94			1.00	0.99		1.00	0.99		1.00	0.93
Flt Protected	0.95	1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1583	3152			1676	3331		1676	3331		1583	3123
Flt Permitted	0.71	1.00			0.55	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	1182	3152			962	3331		1676	3331		1583	3123
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	38	170	113	47	285	67	3	149	1093	49	11	179
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	3	0	0	8
Lane Group Flow (vph)	38	283	0	0	332	68	0	149	1139	0	11	322
Turn Type	Perm	NA		Perm	Perm	NA		Prot	NA		Prot	NA
Protected Phases		4				8		5	2		1	6
Permitted Phases	4			8	8							
Actuated Green, G (s)	32.1	32.1			32.1	32.1		12.5	32.8		0.7	21.0
Effective Green, g (s)	32.1	32.1			32.1	32.1		12.5	32.8		0.7	21.0
Actuated g/C Ratio	0.33	0.33			0.33	0.33		0.13	0.34		0.01	0.22
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)	392	1047			319	1106		216	1131		11	678
v/s Ratio Prot		0.09				0.02		c0.09	c0.34		0.01	0.10
v/s Ratio Perm	0.03				c0.34							
v/c Ratio	0.10	0.27			1.04	0.06		0.69	1.01		1.00	0.48
Uniform Delay, d1	22.3	23.7			32.2	22.0		40.2	31.9		47.9	33.0
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.1			61.4	0.0		8.9	28.4		271.4	0.5
Delay (s)	22.4	23.8			93.6	22.0		49.0	60.3		319.3	33.5
Level of Service	C	C			F	C		D	E		F	C
Approach Delay (s)		23.6				81.2			59.0			42.7
Approach LOS		C				F			E			D
Intersection Summary												
HCM 2000 Control Delay			54.7		HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			96.6		Sum of lost time (s)				16.0			
Intersection Capacity Utilization			87.3%		ICU Level of Service				E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
38: Bloomington Ave & Riverside Ave & Merrill Ave

2040 Conditions

11/21/2016



Movement	SBR	SBR2	NEL	NER	NER2
Lane Configurations			LT	RT	RT
Traffic Volume (vph)	109	28	191	161	0
Future Volume (vph)	109	28	191	161	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800
Total Lost time (s)			4.0		
Lane Util. Factor			0.97		
Frt			0.93		
Flt Protected			0.97		
Satd. Flow (prot)			3104		
Flt Permitted			0.97		
Satd. Flow (perm)			3104		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	120	31	210	177	0
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	0	387	0	0
Turn Type			Prot		Perm
Protected Phases			9		
Permitted Phases					9
Actuated Green, G (s)			15.0		
Effective Green, g (s)			15.0		
Actuated g/C Ratio			0.16		
Clearance Time (s)			4.0		
Vehicle Extension (s)			3.0		
Lane Grp Cap (vph)			481		
v/s Ratio Prot			c0.12		
v/s Ratio Perm					
v/c Ratio			0.80		
Uniform Delay, d1			39.4		
Progression Factor			1.00		
Incremental Delay, d2			9.5		
Delay (s)			48.8		
Level of Service			D		
Approach Delay (s)			48.8		
Approach LOS			D		
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

2040 Conditions

39: Riverside Ave & Randall Ave

11/21/2016

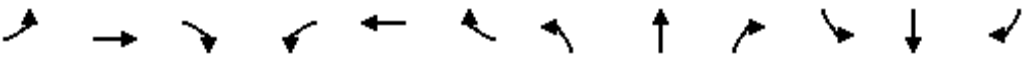
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	96	64	74	78	49	63	1098	141	37	583	42
Future Volume (vph)	35	96	64	74	78	49	63	1098	141	37	583	42
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.94		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1659		1583	1662		1583	3296		1583	3319	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1659		1583	1662		1583	3296		1583	3319	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	36	100	67	77	81	51	66	1144	147	39	607	44
RTOR Reduction (vph)	0	25	0	0	23	0	0	10	0	0	5	0
Lane Group Flow (vph)	36	142	0	77	109	0	66	1281	0	39	646	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.2	12.2		10.9	10.9		6.7	38.7		2.5	34.5	
Effective Green, g (s)	12.2	12.2		10.9	10.9		6.7	38.7		2.5	34.5	
Actuated g/C Ratio	0.15	0.15		0.14	0.14		0.08	0.48		0.03	0.43	
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)	240	252		214	225		132	1588		49	1425	
v/s Ratio Prot	0.02	c0.09		0.05	c0.07		c0.04	c0.39		0.02	0.19	
v/s Ratio Perm												
v/c Ratio	0.15	0.57		0.36	0.48		0.50	0.81		0.80	0.45	
Uniform Delay, d1	29.6	31.6		31.5	32.1		35.2	17.6		38.6	16.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	2.9		1.0	1.6		3.0	3.1		58.3	0.2	
Delay (s)	29.8	34.5		32.6	33.7		38.2	20.7		97.0	16.4	
Level of Service	C	C		C	C		D	C		F	B	
Approach Delay (s)		33.7			33.3			21.6			21.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			23.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			80.3			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			67.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

40: Riverside Ave & San Bernardino Ave

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	296	138	222	191	94	206	1039	417	85	394	38
Future Volume (vph)	82	296	138	222	191	94	206	1039	417	85	394	38
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1680		1583	1765	1500	1583	3209		1583	3308	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1680		1583	1765	1500	1583	3209		1583	3308	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	84	302	141	227	195	96	210	1060	426	87	402	39
RTOR Reduction (vph)	0	17	0	0	0	69	0	43	0	0	7	0
Lane Group Flow (vph)	84	426	0	227	195	27	210	1443	0	87	434	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	8.3	22.8		14.0	28.5	28.5	18.0	42.0		6.0	30.0	
Effective Green, g (s)	8.3	22.8		14.0	28.5	28.5	18.0	42.0		6.0	30.0	
Actuated g/C Ratio	0.08	0.23		0.14	0.28	0.28	0.18	0.42		0.06	0.30	
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)	130	380		219	499	424	282	1337		94	984	
v/s Ratio Prot	0.05	c0.25		c0.14	0.11		c0.13	c0.45		0.05	0.13	
v/s Ratio Perm						0.02						
v/c Ratio	0.65	1.12		1.04	0.39	0.06	0.74	1.08		0.93	0.44	
Uniform Delay, d1	44.8	39.0		43.4	29.1	26.4	39.2	29.4		47.2	28.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.5	83.2		70.7	0.5	0.1	10.2	49.0		68.3	0.3	
Delay (s)	55.4	122.2		114.1	29.7	26.5	49.4	78.4		115.5	28.9	
Level of Service	E	F		F	C	C	D	E		F	C	
Approach Delay (s)		111.5			66.1			74.8			43.2	
Approach LOS		F			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			74.2									
HCM 2000 Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			100.8									
Intersection Capacity Utilization			102.1%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

41: Riverside Ave & Valley Blvd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	261	637	264	239	67	899	1514	516	65	685	45
Future Volume (vph)	100	261	637	264	239	67	899	1514	516	65	685	45
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1600	1800	1800	1700	1800	1800
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	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		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)	1583	3353	1500	1583	3353	1500	2891	4634		1583	4773	
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)	1583	3353	1500	1583	3353	1500	2891	4634		1583	4773	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	102	266	650	269	244	68	917	1545	527	66	699	46
RTOR Reduction (vph)	0	0	441	0	0	51	0	62	0	0	7	0
Lane Group Flow (vph)	102	266	209	269	244	17	917	2010	0	66	738	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	9.4	17.0	17.0	17.0	24.6	24.6	31.0	45.0		5.0	19.0	
Effective Green, g (s)	9.4	17.0	17.0	17.0	24.6	24.6	31.0	45.0		5.0	19.0	
Actuated g/C Ratio	0.09	0.17	0.17	0.17	0.25	0.25	0.31	0.45		0.05	0.19	
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)	148	570	255	269	824	369	896	2085		79	906	
v/s Ratio Prot	0.06	0.08		c0.17	0.07		c0.32	c0.43		0.04	0.15	
v/s Ratio Perm			c0.14			0.01						
v/c Ratio	0.69	0.47	0.82	1.00	0.30	0.05	1.02	0.96		0.84	0.81	
Uniform Delay, d1	43.9	37.4	40.0	41.5	30.7	28.7	34.5	26.7		47.1	38.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.6	0.6	18.7	54.9	0.2	0.1	36.1	12.3		50.2	5.7	
Delay (s)	56.5	38.0	58.7	96.4	30.9	28.8	70.6	39.0		97.3	44.5	
Level of Service	E	D	E	F	C	C	E	D		F	D	
Approach Delay (s)		53.1			61.0			48.7			48.8	
Approach LOS		D			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			50.9				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			84.4%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

42: Riverside Ave & I-10 WB Ramps

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	434	1	381	600	2554	0	0	1267	331
Future Volume (vph)	0	0	0	434	1	381	600	2554	0	0	1267	331
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1600	1800	1800	1800	1800	1800
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor				0.95	0.91	0.95	0.97	0.91			0.86	1.00
Frt				1.00	0.93	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.97	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1504	1459	1425	2891	4818			6071	1500
Flt Permitted				0.95	0.97	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1504	1459	1425	2891	4818			6071	1500
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	457	1	401	632	2688	0	0	1334	348
RTOR Reduction (vph)	0	0	0	0	2	46	0	0	0	0	0	223
Lane Group Flow (vph)	0	0	0	297	287	227	632	2688	0	0	1334	125
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				21.3	21.3	21.3	22.6	58.1			31.5	31.5
Effective Green, g (s)				21.3	21.3	21.3	22.6	58.1			31.5	31.5
Actuated g/C Ratio				0.24	0.24	0.24	0.26	0.66			0.36	0.36
Clearance Time (s)				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
Lane Grp Cap (vph)				366	355	347	747	3202			2188	540
v/s Ratio Prot							0.22	c0.56			0.22	
v/s Ratio Perm				c0.20	0.20	0.16						0.08
v/c Ratio				0.81	0.81	0.65	0.85	0.84			0.61	0.23
Uniform Delay, d1				31.2	31.1	29.7	30.7	11.1			22.9	19.5
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				12.8	12.6	4.4	8.7	2.1			0.5	0.2
Delay (s)				44.0	43.8	34.1	39.5	13.2			23.4	19.7
Level of Service				D	D	C	D	B			C	B
Approach Delay (s)		0.0			40.8			18.2			22.6	
Approach LOS		A			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			22.8		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			87.4		Sum of lost time (s)					12.0		
Intersection Capacity Utilization			120.6%		ICU Level of Service					H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

43: Riverside Ave & I-10 EB Ramps

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  		 		
Traffic Volume (vph)	772	4	413	0	0	0	0	2397	837	440	1265	0
Future Volume (vph)	772	4	413	0	0	0	0	2397	837	440	1265	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1800	1800	1800	1600	1800	1800
Total Lost time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor	0.95	0.91	0.95					0.91		0.97	0.95	
Frt	1.00	0.98	0.85					0.96		1.00	1.00	
Flt Protected	0.95	0.96	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1504	1514	1425					4631		2891	3353	
Flt Permitted	0.95	0.96	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1504	1514	1425					4631		2891	3353	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	780	4	417	0	0	0	0	2421	845	444	1278	0
RTOR Reduction (vph)	0	5	68	0	0	0	0	70	0	0	0	0
Lane Group Flow (vph)	413	408	307	0	0	0	0	3196	0	444	1278	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)	21.0	21.0	21.0					47.0		10.0	61.0	
Effective Green, g (s)	21.0	21.0	21.0					47.0		10.0	61.0	
Actuated g/C Ratio	0.23	0.23	0.23					0.52		0.11	0.68	
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)	350	353	332					2418		321	2272	
v/s Ratio Prot								c0.69		c0.15	0.38	
v/s Ratio Perm	c0.27	0.27	0.22									
v/c Ratio	1.18	1.16	0.92					1.32		1.38	0.56	
Uniform Delay, d1	34.5	34.5	33.7					21.5		40.0	7.6	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	106.6	97.8	30.4					147.8		190.7	0.3	
Delay (s)	141.1	132.3	64.1					169.3		230.7	7.9	
Level of Service	F	F	E					F		F	A	
Approach Delay (s)		114.0			0.0			169.3			65.3	
Approach LOS		F			A			F			E	
Intersection Summary												
HCM 2000 Control Delay			129.7					HCM 2000 Level of Service			F	
HCM 2000 Volume to Capacity ratio			1.29									
Actuated Cycle Length (s)			90.0					Sum of lost time (s)		12.0		
Intersection Capacity Utilization			120.6%					ICU Level of Service		H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

44: Riverside Ave & Slover Ave

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	427	0	67	13	6	16	71	2798	0	0	1453	178
Future Volume (vph)	427	0	67	13	6	16	71	2798	0	0	1453	178
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95			0.95	
Frt	1.00	0.85		1.00	0.89		1.00	1.00			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1583	2850		1583	2987		1583	3353			3298	
Flt Permitted	0.74	1.00		0.71	1.00		0.95	1.00			1.00	
Satd. Flow (perm)	1237	2850		1183	2987		1583	3353			3298	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	440	0	69	13	6	16	73	2885	0	0	1498	184
RTOR Reduction (vph)	0	51	0	0	12	0	0	0	0	0	10	0
Lane Group Flow (vph)	440	18	0	13	10	0	73	2885	0	0	1672	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	26.0	26.0		26.0	26.0		5.0	64.4			55.4	
Effective Green, g (s)	26.0	26.0		26.0	26.0		5.0	64.4			55.4	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.05	0.65			0.56	
Clearance Time (s)	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	
Lane Grp Cap (vph)	326	753		312	789		80	2194			1856	
v/s Ratio Prot		0.01			0.00		0.05	c0.86			0.51	
v/s Ratio Perm	c0.36			0.01								
v/c Ratio	1.35	0.02		0.04	0.01		0.91	1.31			0.90	
Uniform Delay, d1	36.2	26.8		26.9	26.7		46.5	17.0			19.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	176.4	0.0		0.1	0.0		71.4	145.1			6.5	
Delay (s)	212.6	26.8		27.0	26.7		117.9	162.1			25.5	
Level of Service	F	C		C	C		F	F			C	
Approach Delay (s)		187.4			26.8			161.0			25.5	
Approach LOS		F			C			F			C	
Intersection Summary												
HCM 2000 Control Delay	118.7			HCM 2000 Level of Service			F					
HCM 2000 Volume to Capacity ratio	1.39											
Actuated Cycle Length (s)	98.4			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	121.4%			ICU Level of Service			H					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

45: Riverside Ave & Jurupa Ave

2040 Conditions

11/21/2016



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	61	135	213	2506	1557	105
Future Volume (vph)	61	135	213	2506	1557	105
Ideal Flow (vphpl)	1700	1800	1700	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1583	1500	1583	4818	3321	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1583	1500	1583	4818	3321	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	63	139	220	2584	1605	108
RTOR Reduction (vph)	0	124	0	0	5	0
Lane Group Flow (vph)	63	15	220	2584	1708	0
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	8.6	8.6	13.8	65.3	47.5	
Effective Green, g (s)	8.6	8.6	13.8	65.3	47.5	
Actuated g/C Ratio	0.11	0.11	0.17	0.80	0.58	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	166	157	266	3841	1926	
v/s Ratio Prot	c0.04		c0.14	0.54	c0.51	
v/s Ratio Perm		0.01				
v/c Ratio	0.38	0.09	0.83	0.67	0.89	
Uniform Delay, d1	34.2	33.1	32.9	3.6	14.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.3	18.6	0.5	5.4	
Delay (s)	35.6	33.4	51.5	4.1	20.2	
Level of Service	D	C	D	A	C	
Approach Delay (s)	34.1			7.8	20.2	
Approach LOS	C			A	C	

Intersection Summary

HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	81.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

46: Riverside Ave & Agua Mansa Rd

2040 Conditions

11/21/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	274	751	150	127	224	105	184	2172	288	94	1332	116	
Future Volume (vph)	274	751	150	127	224	105	184	2172	288	94	1332	116	
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800	
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	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	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)	1583	1765	1500	1583	1765	1500	1583	3294		1583	3353	1500	
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)	1583	1765	1500	1583	1765	1500	1583	3294		1583	3353	1500	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	285	782	156	132	233	109	192	2262	300	98	1388	121	
RTOR Reduction (vph)	0	0	71	0	0	92	0	10	0	0	0	71	
Lane Group Flow (vph)	285	782	85	132	233	17	192	2553	0	98	1388	50	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases			4			8						6	
Actuated Green, G (s)	19.0	29.0	29.0	6.0	16.0	16.0	8.0	45.0		4.0	41.0	41.0	
Effective Green, g (s)	19.0	29.0	29.0	6.0	16.0	16.0	8.0	45.0		4.0	41.0	41.0	
Actuated g/C Ratio	0.19	0.29	0.29	0.06	0.16	0.16	0.08	0.45		0.04	0.41	0.41	
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)	300	511	435	94	282	240	126	1482		63	1374	615	
v/s Ratio Prot	0.18	c0.44		c0.08	0.13		c0.12	c0.77		0.06	0.41		
v/s Ratio Perm			0.06			0.01						0.03	
v/c Ratio	0.95	1.53	0.20	1.40	0.83	0.07	1.52	1.72		1.56	1.01	0.08	
Uniform Delay, d1	40.0	35.5	26.7	47.0	40.7	35.7	46.0	27.5		48.0	29.5	18.0	
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	38.2	248.4	0.2	233.7	17.6	0.1	271.8	327.9		313.7	26.8	0.1	
Delay (s)	78.2	283.9	26.9	280.7	58.3	35.8	317.8	355.4		361.7	56.3	18.1	
Level of Service	E	F	C	F	E	D	F	F		F	E	B	
Approach Delay (s)		203.2			115.1			352.8			72.1		
Approach LOS		F			F			F			E		
Intersection Summary													
HCM 2000 Control Delay			229.5									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.65										
Actuated Cycle Length (s)			100.0								16.0		
Intersection Capacity Utilization			141.8%								H		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

2040 Conditions

47: Acacia Ave & Base Line Rd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	33	834	118	40	786	35	44	125	52	26	100	26
Future Volume (vph)	33	834	118	40	786	35	44	125	52	26	100	26
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.98		1.00	0.99			0.97			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1583	3290		1583	3332			1692			1709	
Flt Permitted	0.28	1.00		0.22	1.00			0.91			0.92	
Satd. Flow (perm)	469	3290		375	3332			1562			1590	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	35	887	126	43	836	37	47	133	55	28	106	28
RTOR Reduction (vph)	0	12	0	0	3	0	0	12	0	0	9	0
Lane Group Flow (vph)	35	1001	0	43	870	0	0	223	0	0	153	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.9	22.9		22.9	22.9			12.7			12.7	
Effective Green, g (s)	22.9	22.9		22.9	22.9			12.7			12.7	
Actuated g/C Ratio	0.53	0.53		0.53	0.53			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)	246	1728		196	1750			454			463	
v/s Ratio Prot		c0.30			0.26							
v/s Ratio Perm	0.07			0.11				c0.14			0.10	
v/c Ratio	0.14	0.58		0.22	0.50			0.49			0.33	
Uniform Delay, d1	5.3	7.1		5.6	6.6			12.8			12.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	0.5		0.6	0.2			0.8			0.4	
Delay (s)	5.6	7.5		6.1	6.9			13.6			12.5	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		7.5			6.8			13.6			12.5	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		8.2			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.55										
Actuated Cycle Length (s)		43.6			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		59.8%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

48: Acacia Ave & Foothill Blvd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	1378	74	46	1062	88	77	108	84	60	117	63
Future Volume (vph)	48	1378	74	46	1062	88	77	108	84	60	117	63
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1583	4781		1583	3314			1666			1681	
Flt Permitted	0.95	1.00		0.95	1.00			0.82			0.84	
Satd. Flow (perm)	1583	4781		1583	3314			1384			1436	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	50	1435	77	48	1106	92	80	112	88	62	122	66
RTOR Reduction (vph)	0	5	0	0	6	0	0	17	0	0	14	0
Lane Group Flow (vph)	50	1507	0	48	1192	0	0	264	0	0	237	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	3.4	36.7		3.4	36.7			20.5			20.5	
Effective Green, g (s)	3.4	36.7		3.4	36.7			20.5			20.5	
Actuated g/C Ratio	0.05	0.51		0.05	0.51			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)	74	2416		74	1675			390			405	
v/s Ratio Prot	c0.03	0.32		0.03	c0.36							
v/s Ratio Perm								c0.19			0.17	
v/c Ratio	0.68	0.62		0.65	0.71			0.68			0.59	
Uniform Delay, d1	34.1	13.0		34.0	13.9			23.1			22.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	21.7	0.5		17.9	1.5			4.6			2.2	
Delay (s)	55.8	13.5		51.9	15.3			27.7			24.6	
Level of Service	E	B		D	B			C			C	
Approach Delay (s)		14.8			16.7			27.7			24.6	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			72.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			69.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Conditions

49: Pepper Ave & Base Line Rd

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	430	208	30	317	110	258	687	64	319	379	348
Future Volume (vph)	275	430	208	30	317	110	258	687	64	319	379	348
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	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	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	0.99		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3189		1583	3223		1583	3310		1583	3112	
Flt Permitted	0.41	1.00		0.26	1.00		0.30	1.00		0.29	1.00	
Satd. Flow (perm)	678	3189		430	3223		508	3310		490	3112	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	293	457	221	32	337	117	274	731	68	339	403	370
RTOR Reduction (vph)	0	59	0	0	34	0	0	7	0	0	135	0
Lane Group Flow (vph)	293	620	0	32	420	0	274	792	0	339	638	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	35.0	35.0		35.0	35.0		57.0	57.0		57.0	57.0	
Effective Green, g (s)	35.0	35.0		35.0	35.0		57.0	57.0		57.0	57.0	
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.57	0.57		0.57	0.57	
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)	237	1116		150	1128		289	1886		279	1773	
v/s Ratio Prot		0.19			0.13			0.24			0.21	
v/s Ratio Perm	c0.43			0.07			0.54			c0.69		
v/c Ratio	1.24	0.56		0.21	0.37		0.95	0.42		1.22	0.36	
Uniform Delay, d1	32.5	26.2		22.8	24.3		20.1	12.2		21.5	11.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	137.1	0.6		0.7	0.2		41.2	0.7		125.0	0.6	
Delay (s)	169.6	26.8		23.5	24.5		61.3	12.8		146.5	12.2	
Level of Service	F	C		C	C		E	B		F	B	
Approach Delay (s)		69.9			24.4			25.2			53.1	
Approach LOS		E			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			45.6				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			1.22									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			85.3%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

50: Pepper Ave & Foothill Blvd

2040 Conditions

11/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	763	282	91	709	79	201	685	161	81	432	188
Future Volume (vph)	335	763	282	91	709	79	201	685	161	81	432	188
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
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	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3353	1500	1583	3303		1583	3257		1583	3201	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.30	1.00		0.19	1.00	
Satd. Flow (perm)	1583	3353	1500	1583	3303		508	3257		314	3201	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	356	812	300	97	754	84	214	729	171	86	460	200
RTOR Reduction (vph)	0	0	181	0	8	0	0	20	0	0	49	0
Lane Group Flow (vph)	356	812	119	97	830	0	214	880	0	86	611	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	22.0	37.8	37.8	9.0	24.8		42.0	42.0		42.0	42.0	
Effective Green, g (s)	22.0	37.8	37.8	9.0	24.8		42.0	42.0		42.0	42.0	
Actuated g/C Ratio	0.22	0.37	0.37	0.09	0.25		0.42	0.42		0.42	0.42	
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)	345	1257	562	141	812		211	1357		130	1333	
v/s Ratio Prot	c0.22	0.24		0.06	c0.25			0.27			0.19	
v/s Ratio Perm			0.08				c0.42			0.27		
v/c Ratio	1.03	0.65	0.21	0.69	1.02		1.01	0.65		0.66	0.46	
Uniform Delay, d1	39.4	26.0	21.4	44.5	38.0		29.4	23.5		23.7	21.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	56.9	1.2	0.2	13.1	37.2		65.7	2.4		23.5	1.1	
Delay (s)	96.3	27.1	21.6	57.6	75.2		95.1	25.9		47.1	22.3	
Level of Service	F	C	C	E	E		F	C		D	C	
Approach Delay (s)		42.8			73.4			39.2			25.2	
Approach LOS		D			E			D			C	
Intersection Summary												
HCM 2000 Control Delay	45.5			HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio	1.02											
Actuated Cycle Length (s)	100.8			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	88.8%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

APPENDIX D: IMPROVEMENT COST ESTIMATES



CITY OF RIALTO
Sierra Avenue/Riverside Avenue
Preliminary Opinion on Probable Project Cost

PSOMAS

Preparer(s): Karen Nguyen

Reviewer: Arief Naftali

Date Updated: 11/18/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 20,000.00	\$20,000	
Construction Survey	1	LS	\$ 10,000.00	\$10,000	
Construction Management & Inspection	1	LS	\$ 40,000.00	\$40,000	Performed by Psomas
Construction Administration	1	LS	\$ 20,000.00	\$20,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$5,000	
Clearing and Grubbing	1	LS	\$ 1,100.00	\$1,100	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 10,000.00	\$10,000	
Miscellaneous Subtotal				\$ 106,100	
Intersection					
Construct Type 8 Integral Curb and Gutter	400	LF	\$ 19.00	\$ 7,600	
Construct 4" PCC Sidewalk	4,000	SF	\$ 5.95	\$ 23,800	10' Sidewalk
Construct Curb Ramps	4	EA	\$ 2,390.00	\$ 9,560	
Construct AC/AB Pavement	6,000	SF	\$ 4.00	\$ 24,000	
Traffic Signals	4	LEG	\$ 50,000.00	\$ 200,000	
Intersection Construction Subtotal =				\$ 264,960	
Utility Improvements					
Construct Catch Basin - 7'		EA	\$ 6,240.00	\$0	
Construct Catch Basin - 14'		EA	\$ 11,350.00	\$0	
Construct Junction Structure		EA	\$ 2,837.00	\$0	
Construct Local Depression		EA	\$ 1,192.00	\$0	
Adjust Sewer Manhole to Grade		EA	\$ 800.00	\$0	
Adjust Unknown Manhole to Grade		EA	\$ 800.00	\$0	
Relocate Power Pole (by others)	2	EA	\$ -	\$0	SCE will handle cost of relocation
Relocate Street Light	2	EA	\$ 6,810.00	\$13,620	
Relocate Fire Hydrant		EA	\$ 3,000.00	\$0	
Relocate Vent		EA	\$ 10,000.00	\$0	
Relocate Vault		EA	\$ 5,000.00	\$0	
Relocate Cabinet		EA	\$ 5,000.00	\$0	
Utility Improvements Subtotal =				\$ 13,620	
Landscaping and Irrigation Improvements					
Median Landscaping	0	LS	\$ -	\$ -	
Median Irrigation	0	LS	\$ -	\$ -	
Water and Electrical POC's	0	LS	\$ -	\$ -	
Tree Removal	0	EA	\$ -	\$ -	
Landscaping and Irrigation Improvements Subtotal =				\$ -	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 1,200.00	\$ 1,200	
Subtotal =				\$385,880	
Contingency (15%) =				\$57,900	
CONSTRUCTION TOTAL =				\$444,000	
DESIGN TOTAL (20% of Construction Costs) =				\$88,800	
GRAND TOTAL				\$532,800	



CITY OF RIALTO
Alder Avenue/Base Line Road
Preliminary Opinion on Probable Project Cost

PSOMAS

Preparer(s): Karen Nguyen

Reviewer: Arief Naftali

Date Updated: 11/18/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 20,000.00	\$ 20,000	
Construction Survey	1	LS	\$ 10,000.00	\$ 10,000	
Construction Management & Inspection	1	LS	\$ 40,000.00	\$ 40,000	Performed by Psomas
Construction Administration	1	LS	\$ 20,000.00	\$ 20,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$ 5,000	
Clearing and Grubbing	1	LS	\$ 400.00	\$ 400	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 10,000.00	\$ 10,000	
Miscellaneous Subtotal				\$ 105,400	
Intersection					
Construct Type 8 Integral Curb and Gutter	330	LF	\$ 19.00	\$ 6,270	
Construct 4" PCC Sidewalk	3,300	SF	\$ 5.95	\$ 19,635	10' Sidewalk
Construct Curb Ramps	3	EA	\$ 2,390.00	\$ 7,170	
Construct AC/AB Pavement	4,700	SF	\$ 8.00	\$ 37,600	
Tentative ROW take	10,200	SF	\$ 15.00	\$ 153,000	
Traffic Signal Relocation Per Pole, PPB Pole	2	EA	\$ 3,225.00	\$ 6,450	
Traffic Signal Relocation Per Pole, 1A (10') Pole	4	EA	\$ 6,550.00	\$ 26,200	
Traffic Signal Relocation Per Pole, Pole With Mastarm	4	EA	\$ 13,100.00	\$ 52,400	
Relocate PB or Adj. Grade	14	EA	\$ 120.00	\$ 1,680	
Traffic Signal Loops	0	EA	\$ 450.00	\$ -	
Intersection Construction Subtotal =				\$ 310,405	
Utility Improvements					
Construct Catch Basin - 7'	0	EA	\$ 6,240.00	\$ -	
Construct Catch Basin - 14'	0	EA	\$ 11,350.00	\$ -	
Construct Junction Structure	0	EA	\$ 2,837.00	\$ -	
Construct Local Depression	0	EA	\$ 1,192.00	\$ -	
Adjust Sewer Manhole to Grade	0	EA	\$ 800.00	\$ -	
Adjust Unknown Manhole to Grade	0	EA	\$ 800.00	\$ -	
Relocate Power Pole	4	EA	\$ -	\$ -	SCE will handle cost of relocation
Relocate Street Light	0	EA	\$ 6,810.00	\$ -	
Relocate Fire Hydrant	1	EA	\$ 3,000.00	\$ 3,000	
Relocate Vent	0	EA	\$ 10,000.00	\$ -	
Relocate Vault	0	EA	\$ 5,000.00	\$ -	
Relocate Cabinet	2	EA	\$ 5,000.00	\$ 10,000	
Utility Improvements Subtotal =				\$ 13,000	
Landscaping and Irrigation Improvements					
Median Landscaping	0	LS	\$ -	\$ -	
Median Irrigation	0	LS	\$ -	\$ -	
Water and Electrical POC's	0	LS	\$ -	\$ -	
Tree Removal	0	EA	\$ -	\$ -	
Landscaping and Irrigation Improvements Subtotal =				\$ -	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 4,000.00	\$ 4,000	
				Subtotal = \$	432,805
				Contingency (15%) = \$	64,900
CONSTRUCTION TOTAL =				\$498,000	
DESIGN TOTAL (20% of Construction Costs) =				\$99,600	
GRAND TOTAL				\$597,600	



CITY OF RIALTO
Ayala Avenue/Base Line Road
Preliminary Opinion on Probable Project Cost

P S O M A S

Preparer(s): Karen Nguyen

Reviewer: Arief Naftali

Date Updated: 11/18/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 10,000.00	\$ 10,000	
Construction Survey	1	LS	\$ 5,000.00	\$ 5,000	
Construction Management & Inspection	1	LS	\$ 20,000.00	\$ 20,000	Performed by Psomas
Construction Administration	1	LS	\$ 20,000.00	\$ 20,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$ 5,000	
Clearing and Grubbing	1	LS	\$ 17,200.00	\$ 17,200	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 10,000.00	\$ 10,000	
Miscellaneous Subtotal				\$ 87,200	
Intersection					
Construct Type 8 Integral Curb and Gutter	360	LF	\$ 19.00	\$ 6,840	
Construct 4" PCC Sidewalk	6,580	SF	\$ 5.95	\$ 39,151	10' Sidewalk
Construct 8" Median Curb	280	LF	\$ 15.00	\$ 4,200	
Construct PCC Paving in Medians	420	SF	\$ 5.95	\$ 2,499	Assume 18" band
Construct Curb Ramps	2	EA	\$ 2,390.00	\$ 4,780	
Construct AC/AB Pavement	2,400	SF	\$ 4.00	\$ 9,600	
Traffic Signal Relocation Per Pole, 1A (10') Pole	2	EA	\$ 6,550.00	\$ 13,100	
Traffic Signal Relocation Per Pole, Pole With Mastarm	2	EA	\$ 13,100.00	\$ 26,200	
Relocate PB or Adj. Grade	4	EA	\$ 120.00	\$ 480	
Traffic Signal Loops	0	EA	\$ 450.00	\$ -	
Intersection Construction Subtotal =				\$ 106,850	
Utility Improvements					
Construct Catch Basin - 7'	0	EA	\$ 6,240.00	\$ -	
Construct Catch Basin - 14'	0	EA	\$ 11,350.00	\$ -	
Construct Junction Structure	0	EA	\$ 2,837.00	\$ -	
Construct Local Depression	0	EA	\$ 1,192.00	\$ -	
Adjust Sewer Manhole to Grade	0	EA	\$ 800.00	\$ -	
Adjust Unknown Manhole to Grade	0	EA	\$ 800.00	\$ -	
Relocate Power Pole	1	EA	\$ -	\$ -	SCE will handle relocation cost
Relocate Street Light	0	EA	\$ 6,810.00	\$ -	
Relocate Fire Hydrant	0	EA	\$ 3,000.00	\$ -	
Relocate Vent	0	EA	\$ 10,000.00	\$ -	
Relocate Vault	0	EA	\$ 5,000.00	\$ -	
Relocate Cabinet	0	EA	\$ 5,000.00	\$ -	
Utility Improvements Subtotal =				\$ -	
Landscaping and Irrigation Improvements					
Median Landscaping	0	LS	\$ 10,000.00	\$ -	
Median Irrigation	0	LS	\$ 10,000.00	\$ -	
Water and Electrical POC's	0	LS	\$ -	\$ -	
Tree Removal	0	EA	\$ -	\$ -	
Landscaping and Irrigation Improvements Subtotal =				\$ -	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 1,200.00	\$ 1,200	
Subtotal =				\$ 195,250	
Contingency (15%) =				\$ 29,300	
CONSTRUCTION TOTAL =				\$225,000	
DESIGN TOTAL (20% of Construction Costs) =				\$45,000	
GRAND TOTAL				\$270,000	



CITY OF RIALTO
Cedar Avenue/Rialto Avenue
Preliminary Opinion on Probable Project Cost

PSOMAS

Preparer(s): Karen Nguyen

Reviewer: Arief Naftali

Date Updated: 11/18/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 10,000.00	\$ 10,000	
Construction Survey	1	LS	\$ 5,000.00	\$ 5,000	
Construction Management & Inspection	1	LS	\$ 10,000.00	\$ 10,000	Performed by Psomas
Construction Administration	1	LS	\$ 10,000.00	\$ 10,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 2,000.00	\$ 2,000	
Clearing and Grubbing	1	LS	\$ 4,600.00	\$ 4,600	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 5,000.00	\$ 5,000	
Miscellaneous Subtotal =				\$ 46,600	
Intersection					
Construct Type 8 Integral Curb and Gutter	165	LF	\$ 19.00	\$ 3,135	
Construct 4" PCC Sidewalk	1,650	SF	\$ 5.95	\$ 9,818	10' Sidewalk
Construct Curb Ramps	1	EA	\$ 2,390.00	\$ 2,390	
Construct AC/AB Pavement	1,200	SF	\$ 4.00	\$ 4,800	
Tentative ROW Take	600	SF	\$ 15.00	\$ 9,000	
Traffic Signal Relocation Per Pole, 1A (10') Pole	1	EA	\$ 6,550.00	\$ 6,550	
Traffic Signal Relocation Per Pole, Pole With Mastarm	1	EA	\$ 13,100.00	\$ 13,100	
Relocate PB or Adj. Grade	4	EA	\$ 120.00	\$ 480	
Traffic Signal Loops	8	EA	\$ 450.00	\$ 3,600	
Intersection Construction Subtotal =				\$ 52,873	
Utility Improvements					
Construct Catch Basin - 7'	0	EA	\$ 6,240.00	\$ -	
Construct Catch Basin - 14'	0	EA	\$ 11,350.00	\$ -	
Construct Junction Structure	0	EA	\$ 2,837.00	\$ -	
Construct Local Depression	0	EA	\$ 1,192.00	\$ -	
Adjust Sewer Manhole to Grade	0	EA	\$ 800.00	\$ -	
Adjust Unknown Manhole to Grade	3	EA	\$ 800.00	\$ 2,400	
Adjust Water Valve to Grade	5	EA	\$ 500.00	\$ 2,500	
Relocate Power Pole	1	EA	\$ -	\$ -	SCE will handle relocation cost
Relocate Street Light	0	EA	\$ 6,810.00	\$ -	
Relocate Fire Hydrant	1	EA	\$ 3,000.00	\$ 3,000	
Relocate Vent	0	EA	\$ 10,000.00	\$ -	
Relocate Vault	0	EA	\$ 5,000.00	\$ -	
Relocate Cabinet	2	EA	\$ 5,000.00	\$ 10,000	
Utility Improvements Subtotal =				\$ 17,900	
Landscaping and Irrigation Improvements					
Median Landscaping	0	LS	\$ -	\$ -	
Median Irrigation	0	LS	\$ -	\$ -	
Water and Electrical POC's	0	LS	\$ -	\$ -	
Tree Removal	0	EA	\$ -	\$ -	
Landscaping and Irrigation Improvements Subtotal =				\$ -	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 420.00	\$ 420	
Subtotal =				\$ 117,793	
Contingency (15%) =				\$ 17,700	
CONSTRUCTION TOTAL =				\$135,000	
DESIGN TOTAL (20% of Construction Costs) =				\$27,000	
GRAND TOTAL				\$162,000	



CITY OF RIALTO
Cactus Avenue/Base Line Road
Preliminary Opinion on Probable Project Cost

PSOMAS

Preparer(s): Karen Nguyen

Reviewer: Arief Naftali

Date Updated: 11/18/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 20,000.00	\$ 20,000	
Construction Survey	1	LS	\$ 10,000.00	\$ 10,000	
Construction Management & Inspection	1	LS	\$ 80,000.00	\$ 80,000	Performed by Psomas
Construction Administration	1	LS	\$ 20,000.00	\$ 20,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$ 5,000	
Clearing and Grubbing	1	LS	\$ 90,900.00	\$ 90,900	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 10,000.00	\$ 10,000	
Miscellaneous Subtotal				\$ 235,900	
Intersection					
Construct Type 8 Integral Curb and Gutter	2,000	LF	\$ 19.00	\$ 38,000	
Construct 4" PCC Sidewalk	34,000	SF	\$ 5.95	\$ 202,300	10' Sidewalk
Construct 8" Median Curb	690	LF	\$ 15.00	\$ 10,350	
Construct PCC Paving in Medians	1,035	SF	\$ 5.95	\$ 6,158	Assume 18" band
Construct Commercial Driveway	420	SF	\$ 10.75	\$ 4,515	
Construct Curb Ramps	4	EA	\$ 2,390.00	\$ 9,560	
Construct AC/AB Pavement	12,800	SF	\$ 4.00	\$ 51,200	
Tentative ROW Take	16,200	SF	\$ 15.00	\$ 243,000	
Traffic Signal Relocation Per Pole, 1A (10') Pole	4	EA	\$ 6,550.00	\$ 26,200	
Traffic Signal Relocation Per Pole, Pole With Mastarm	4	EA	\$ 13,100.00	\$ 52,400	
Relocate PB or Adj. Grade	16	EA	\$ 120.00	\$ 1,920	
Traffic Signal Loops	0	EA	\$ 450.00	\$ -	
Intersection Construction Subtotal =				\$ 645,603	
Utility Improvements					
Construct Catch Basin - 7'	1	EA	\$ 6,240.00	\$ 6,240	
Construct Catch Basin - 14'	0	EA	\$ 11,350.00	\$ -	
Construct Junction Structure	0	EA	\$ 2,837.00	\$ -	
Construct Local Depression	0	EA	\$ 1,192.00	\$ -	
Adjust Sewer Manhole to Grade	0	EA	\$ 800.00	\$ -	
Adjust Unknown Manhole to Grade	4	EA	\$ 800.00	\$ 3,200	
Relocate Power Pole	7	EA	\$ -	\$ -	SCE will handle relocation cost
Relocate Street Light	2	EA	\$ 6,810.00	\$ 13,620	
Relocate Fire Hydrant	3	EA	\$ 3,000.00	\$ 9,000	
Relocate Vent	0	EA	\$ 10,000.00	\$ -	
Relocate Vault	0	EA	\$ 5,000.00	\$ -	
Relocate Cabinet	12	EA	\$ 5,000.00	\$ 60,000	
Utility Improvements Subtotal =				\$ 92,060	
Landscaping and Irrigation Improvements					
Median Landscaping	1	LS	\$ 10,000.00	\$ 10,000	
Median Irrigation	1	LS	\$ 10,000.00	\$ 10,000	
Water and Electrical POC's	0	LS	\$ -	\$ -	
Tree Removal	0	EA	\$ -	\$ -	
Landscaping and Irrigation Improvements Subtotal =				\$ 20,000	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 4,000.00	\$ 4,000	
Subtotal =				\$ 997,563	
Contingency (15%) =				\$ 149,600	
CONSTRUCTION TOTAL =				\$1,147,000	
DESIGN TOTAL (20% of Construction Costs) =				\$229,400	
GRAND TOTAL				\$1,376,400	



CITY OF RIALTO
Riverside Avenue/Slover Avenue
Preliminary Opinion on Probable Project Cost

PSOMAS

Preparer(s): Karen Nguyen
Reviewer: Arief Naftali

Date Updated: 11/18/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 20,000.00	\$ 20,000	
Construction Survey	1	LS	\$ 10,000.00	\$ 10,000	
Construction Management & Inspection	1	LS	\$ 40,000.00	\$ 40,000	Performed by Psomas
Construction Administration	1	LS	\$ 20,000.00	\$ 20,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$ 5,000	
Clearing and Grubbing	1	LS	\$ 3,500.00	\$ 3,500	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 15,000.00	\$ 15,000	
Miscellaneous Subtotal				\$ 113,500	
Intersection					
Construct Type 8 Integral Curb and Gutter	190	LF	\$ 19.00	\$ 3,610	
Construct 4" PCC Sidewalk	1,900	SF	\$ 5.95	\$ 11,305	10' Sidewalk
Construct Curb Ramps	4	EA	\$ 2,390.00	\$ 9,560	
Traffic Signal Relocation Per Pole, 1A (10') Pole	4	EA	\$ 6,550.00	\$ 26,200	
Traffic Signal Relocation Per Pole, Pole With Mastarm	4	EA	\$ 13,100.00	\$ 52,400	
Relocate PB or Adj. Grade	8	EA	\$ 120.00	\$ 960	
Traffic Signal Loops	32	EA	\$ 450.00	\$ 14,400	
Intersection Construction Subtotal =				\$ 118,435	
Utility Improvements					
Construct Catch Basin - 7'	1	EA	\$ 6,240.00	\$ 6,240	
Construct Catch Basin - 14'	1	EA	\$ 11,350.00	\$ 11,350	
Construct Junction Structure	0	EA	\$ 2,837.00	\$ -	
Construct Local Depression	0	EA	\$ 1,192.00	\$ -	
Adjust Sewer Manhole to Grade	2	EA	\$ 800.00	\$ 1,600	
Adjust Unknown Manhole to Grade	2	EA	\$ 800.00	\$ 1,600	
Adjust Water Valve to Grade	3	EA	\$ 500.00	\$ 1,500	
Relocate Power Pole	1	EA		\$ -	SCE will handle relocation cost
Relocate Street Light	0	EA	\$ 6,810.00	\$ -	
Relocate Fire Hydrant	1	EA	\$ 3,000.00	\$ 3,000	
Relocate Vent	0	EA	\$ 10,000.00	\$ -	
Relocate Vault	0	EA	\$ 5,000.00	\$ -	
Relocate Cabinet	0	EA	\$ 5,000.00	\$ -	
Utility Improvements Subtotal =				\$ 25,290	
Landscaping and Irrigation Improvements					
Median Landscaping	0	LS	\$ -	\$ -	
Median Irrigation	0	LS	\$ -	\$ -	
Water and Electrical POC's	0	LS	\$ -	\$ -	
Tree Removal	0	EA	\$ -	\$ -	
Landscaping and Irrigation Improvements Subtotal =				\$ -	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 310.00	\$ 310	
Subtotal =				\$ 257,535	
Contingency (15%) =				\$ 38,600	
CONSTRUCTION TOTAL =				\$296,000	
DESIGN TOTAL (20% of Construction Costs) =				\$59,200	
GRAND TOTAL				\$355,200	



CITY OF RIALTO
Riverside Avenue/Jurupa Avenue
Preliminary Opinion on Probable Project Cost

PSOMAS

Preparer(s): Karen Nguyen
Reviewer: Arief Naftali

Date Updated: 11/17/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 10,000.00	\$ 10,000	
Construction Survey	1	LS	\$ 5,000.00	\$ 5,000	
Construction Management & Inspection	1	LS	\$ 10,000.00	\$ 10,000	Performed by Psomas
Construction Administration	1	LS	\$ 10,000.00	\$ 10,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 2,000.00	\$ 2,000	
Clearing and Grubbing	1	LS	\$ 1,900.00	\$ 1,900	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 10,000.00	\$ 10,000	
Miscellaneous Subtotal				\$ 48,900	
Intersection					
Construct Type 8 Integral Curb and Gutter	70	LF	\$ 19.00	\$ 1,330	
Construct 4" PCC Sidewalk	700	SF	\$ 5.95	\$ 4,165	10' Sidewalk
Construct Curb Ramps	1	EA	\$ 2,390.00	\$ 2,390	
Traffic Signal Relocation Per Pole, 1A (10') Pole	1	EA	\$ 6,550.00	\$ 6,550	
Traffic Signal Relocation Per Pole, Pole With Mastarm	1	EA	\$ 13,100.00	\$ 13,100	
Relocate PB or Adj. Grade	2	EA	\$ 120.00	\$ 240	
Traffic Signal Loops	0	EA	\$ 450.00	\$ -	
Intersection Construction Subtotal =				\$ 27,775	
Utility Improvements					
Construct Catch Basin - 7'	1	EA	\$ 6,240.00	\$ 6,240	
Construct Catch Basin - 14'	0	EA	\$ 11,350.00	\$ -	
Construct Junction Structure	0	EA	\$ 2,837.00	\$ -	
Construct Local Depression	0	EA	\$ 1,192.00	\$ -	
Adjust Sewer Manhole to Grade	0	EA	\$ 800.00	\$ -	
Adjust Unknown Manhole to Grade	0	EA	\$ 800.00	\$ -	
Adjust Water Valve to Grade	1	EA	\$ 500.00	\$ 500	
Relocate Power Pole	0	EA	\$ 50,000.00	\$ -	
Relocate Street Light	0	EA	\$ 6,810.00	\$ -	
Relocate Fire Hydrant	0	EA	\$ 3,000.00	\$ -	
Relocate Vent	0	EA	\$ 10,000.00	\$ -	
Relocate Vault	0	EA	\$ 5,000.00	\$ -	
Relocate Cabinet	1	EA	\$ 5,000.00	\$ 5,000	
Utility Improvements Subtotal =				\$ 11,740	
Landscaping and Irrigation Improvements					
Median Landscaping	0	LS	\$ -	\$ -	
Median Irrigation	0	LS	\$ -	\$ -	
Water and Electrical POC's	0	LS	\$ -	\$ -	
Tree Removal	0	EA	\$ -	\$ -	
Landscaping and Irrigation Improvements Subtotal =				\$ -	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 50.00	\$ 50	
Subtotal =				\$ 88,465	
Contingency (15%) =				\$ 13,300	
CONSTRUCTION TOTAL =				\$102,000	
DESIGN TOTAL (20% of Construction Costs) =				\$20,400	
GRAND TOTAL				\$122,400	



CITY OF RIALTO
Riverside Avenue/Agua Mansa Road
Preliminary Opinion on Probable Project Cost

P S O M A S

Preparer(s): Karen Nguyen
Reviewer: Arief Naftali

Date Updated: 11/18/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 20,000.00	\$ 20,000	
Construction Survey	1	LS	\$ 10,000.00	\$ 10,000	
Construction Management & Inspection	1	LS	\$ 40,000.00	\$ 40,000	Performed by Psomas
Construction Administration	1	LS	\$ 20,000.00	\$ 20,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$ 5,000	
Clearing and Grubbing	1	LS	\$ 9,400.00	\$ 9,400	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 10,000.00	\$ 10,000	
Miscellaneous Subtotal				\$ 114,400	
Intersection					
Construct Type 8 Integral Curb and Gutter	600	LF	\$ 19.00	\$ 11,400	
Construct 4" PCC Sidewalk	6,000	SF	\$ 5.95	\$ 35,700	10' Sidewalk
Construct 8" Median Curb	435	LF	\$ 15.00	\$ 6,525	
Construct PCC Paving in Medians	653	SF	\$ 5.95	\$ 3,882	Assume 18" band
Construct Commerical Driveway	1,464	SF	\$ 10.75	\$ 15,738	
Construct Curb Ramps	4	EA	\$ 2,390.00	\$ 9,560	
Construct AC/AB Pavement	5,080	SF	\$ 4.00	\$ 20,320	
Tentative ROW Take	5,080	SF	\$ 15.00	\$ 76,200	
Traffic Signal Relocation Per Pole, PPB Pole	1	EA	\$ 3,225.00	\$ 3,225	
Traffic Signal Relocation Per Pole, 1A (10') Pole	4	EA	\$ 6,550.00	\$ 26,200	
Traffic Signal Relocation Per Pole, Pole With Mastarm	4	EA	\$ 13,100.00	\$ 52,400	
Relocate PB or Adj. Grade	7	EA	\$ 120.00	\$ 840	
Traffic Signal Loops	0	EA	\$ 450.00	\$ -	
Intersection Construction Subtotal =				\$ 261,990	
Utility Improvements					
Construct Catch Basin - 7'	0	EA	\$ 6,240.00	\$ -	
Construct Catch Basin - 14'	3	EA	\$ 11,350.00	\$ 34,050	
Construct Junction Structure	0	EA	\$ 2,837.00	\$ -	
Construct Local Depression	0	EA	\$ 1,192.00	\$ -	
Adjust Sewer Manhole to Grade	2	EA	\$ 800.00	\$ 1,600	
Adjust Unknown Manhole to Grade	2	EA	\$ 800.00	\$ 1,600	
Adjust Water Valve to Grade	5	EA	\$ 500.00	\$ 2,500	
Relocate Power Pole	3	EA		\$ -	SCE will handle relocation cost
Relocate Street Light	1	EA	\$ 6,810.00	\$ 6,810	
Relocate Fire Hydrant	1	EA	\$ 3,000.00	\$ 3,000	
Relocate Vent	0	EA	\$ 10,000.00	\$ -	
Relocate Vault	2	EA	\$ 5,000.00	\$ 10,000	
Relocate Cabinent	2	EA	\$ 5,000.00	\$ 10,000	
Utility Improvements Subtotal =				\$ 69,560	
Landscaping and Irrigation Improvements					
Median Landscaping	0	LS	\$ -	\$ -	
Median Irrigation	0	LS	\$ -	\$ -	
Water and Electrical POC's	0	LS	\$ -	\$ -	
Tree Removal	0	EA	\$ -	\$ -	
Landscaping and Irrigation Improvements Subtotal =				\$ -	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 1,000.00	\$ 1,000	
Subtotal =				\$ 446,950	
Contingency (15%) =				\$ 67,000	
CONSTRUCTION TOTAL =				\$514,000	
DESIGN TOTAL (20% of Construction Costs) =				\$102,800	
GRAND TOTAL				\$616,800	

CITY OF RIALTO
Intersection Construction Cost Estimates

No.	# ON MAP	NAME	COSTs	DESIGN COST Est. 20% Const Est	Total Estimate	Improvement	Preliminary Right of Way (ROW) needed	Comments
1	1	Sierra Ave/I-15 NB Ramps	\$ 367,000	\$ 73,400	\$ 440,400	Install a traffic signal and some civil improvements. No civil improvements in City of Fontana ROW	No ROW take at intersection	
3	6	Alder Ave/SR-210 WB Ramps	\$ 106,500	\$ 21,300	\$ 127,800	Add a 2nd NB left-turn lane by re-striping the #1 through lane. At 3rd lane on WB on-ramp (1 lane must be HOV)	Re-stripe, so likely no ROW take	
4	7	Alder Ave/SR-210 EB Ramps	\$ 250,000	\$ 50,000	\$ 300,000	Addition of dedicated NB right-turn lane	No ROW take at intersection	Based on Hall & Foreman cost estimate
5	8	Alder Ave/Renaissance Pkwy	\$ 281,000	\$ 56,200	\$ 337,200	Add a 2nd SB left-turn lane and Re-stripe the SB right-turn lane to a shared through/right-turn lane.	SB approach: 12 ft ROW take	Estimate was based on actual, field condition. Improvement plans being developed by Dokken Engr do not include improvements to EB, WB approaches Right-of-Way related costs have been estimated as part of improvements for corridors (typical)
7	14	Ayala Ave/SR-210 WB Ramps	\$ 141,000	\$ 28,200	\$ 169,200	Widen the SB approach to add a dedicated right-turn lane	SB approach: 12 ft ROW take	
8	16	Ayala Ave/Renaissance Pkwy/Easton	\$ 197,000	\$ 39,400	\$ 236,400	Add a 2nd EB left-turn lane.	EB approach: 12 ft ROW take	Estimate was based on actual, field condition. Improvements per plan completed by Albert Webb dated June 2014 doesn't include the EB approach.
10	18	Cedar Ave/Foothill Blvd	\$ 558,000	\$ 111,600	\$ 669,600	Add a 2nd NB left-turn lane. Add a 2nd SB left-turn lane.	NB approach: 12 ft ROW take SB approach: 12 ft ROW take	
12	24	Cactus Ave/Easton	\$ 300,000	\$ 60,000	\$ 360,000	Install a traffic signal. A precise HCM-based LOS is not available due to number of lanes.		
14	30	Cactus Ave/San Bernardino Ave	\$ 309,000	\$ 61,800	\$ 370,800	Install a traffic signal. A precise HCM-based LOS is not available due to number of lanes.		
15	34	Riverside Ave/Easton	\$ 12,000	\$ 2,400	\$ 14,400	Modify traffic signal to include a WB right-turn overlap phase.	No ROW take at intersection	
16	35	Riverside Ave/Base Line Rd	\$ 250,000	\$ 50,000	\$ 300,000	Add a dedicated EB right-turn lane	EB approach: 12 ft ROW take	

No.	# ON MAP	NAME	COSTs	DESIGN COST Est. 20% Const Est	Total Estimate	Improvement	Preliminary Right of Way (ROW) needed	Comments
18	41	Riverside Ave/Valley Blvd	\$ 468,000	\$ 93,600	\$ 561,600	Add a 2nd WB left-turn lane. Restripe the number two EB through lane to a shared through/right-turn lane	WB approach: 12 ft ROW take EB approach: No ROW take at intersection	
19	43	Riverside Ave/I-10 EB Ramps	\$ 16,826,400	\$ 3,365,300	\$ 20,191,700	Add a dedicated NB right-turn lane. Add a 3rd SB through lane.	NB approach: widen bridge by 12 ft SB approach: widen bridge by 10 ft	Estimate was based on additional improvements on-top of prepared Exhibit by JL Patterson dated Aug 25, 2014.



CITY OF RIALTO
Casmalia Between Locust and Alder
Preliminary Opinion on Probable Project Cost

P S O M A S

Preparer(s): Lisette Bice
Reviewer: Arief Naftali

Date Updated: 08/09/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 200,000.00	\$200,000	
Construction Survey	1	LS	\$ 50,000.00	\$50,000	
Construction Management & Inspection	1	LS	\$ 200,000.00	\$200,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$5,000	
Clearing and Grubbing	1	LS	\$ 38,000.00	\$38,000	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 25,000.00	\$25,000	
Right-of-Way Acquisition	13,970	SF	\$ 15.00	\$209,550	
Road Construction Subtotal =				\$ 771,750	
Road Construction					
Construct Type 8 Integral Curb and Gutter	5,500	LF	\$ 19.00	\$ 104,500	
Construct 4" PCC Sidewalk	32,500	SF	\$ 5.95	\$ 193,375	
Construct 8" Median Curb	5,500	LF	\$ 15.00	\$ 82,500	
Construct PCC Paving in Medians	8,500	SF	\$ 5.95	\$ 50,575	Assume 18" band
Construct Curb Ramps	13	EA	\$ 2,390.00	\$ 31,070	
Construct Parkway Culvert	0	EA	\$ 1,500.00	\$ -	
Subgrade Preparation	21,456	SF	\$ 0.36	\$ 7,724	Top 6" of Soil
1-1/2" Cold Mill (\$35,000 + \$0.80/SF)	36,500	SF	\$ 0.80	\$ 29,200	
Construct 1-1/2" Overlay Asphalt Pavement	36,500	SF	\$ 0.90	\$ 32,850	
Construct 5" Asphalt Pavement/Aggregate Base (5"/6")	21,456	SF	\$ 4.00	\$ 85,824	Full Depth
Construct Commercial Driveway	987	SF	\$ 10.75	\$ 10,610	
Road Construction Subtotal =				\$ 617,618	
Utility Improvements					
Construct Catch Basin - 7'	1	EA	\$ 6,240.00	\$6,240	
Construct Catch Basin - 14'	1	EA	\$ 11,350.00	\$11,350	
Construct Junction Structure	2	EA	\$ 2,837.00	\$5,674	
Construct Local Depression	2	EA	\$ 1,192.00	\$2,384	
Construct 18" RCP	8	LF	\$ 1,135.50	\$9,084	
Adjust Sewer Manhole to Grade	5	EA	\$ 800.00	\$4,000	
Adjust Unknown Manhole to Grade	1	EA	\$ 800.00	\$800	
Relocate Street Light	1	EA	\$ 6,810.00	\$6,810	
Relocate Fire Hydrant	3	EA	\$ 3,000.00	\$9,000	
Relocate Vent	3	EA	\$ 10,000.00	\$30,000	
Relocate Vault	2	EA	\$ 5,000.00	\$10,000	
Relocate Cabinet	2	EA	\$ 5,000.00	\$10,000	
Road Construction Subtotal =				\$105,342	
Landscaping and Irrigation Improvements					
Median Landscaping	2,682	LS	\$ 100.00	\$ 268,200	No Street Trees or Parkway Landscaping
Median Irrigation	2,682	LS	\$ 75.00	\$ 201,150	
Road Construction Subtotal =				\$469,350	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 25,000.00	\$ 25,000	
Subtotal =				\$1,989,060	
Contingency (15%) =				\$298,400	
CONSTRUCTION TOTAL =				\$2,287,500	
DESIGN TOTAL (20% of Construction Costs) =				\$457,500	
GRAND TOTAL =				\$2,745,000	



CITY OF RIALTO
 Pepper between Foothill and Rialto (2631 LF)
 Preliminary Opinion on Probable Project Cost

P S O M A S

Preparer(s): Lisette Bice
 Reviewer: Arief Naftali

Date Updated: 08/09/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 300,000.00	\$300,000	
Construction Survey	1	LS	\$ 50,000.00	\$50,000	
Construction Management & Inspection	1	LS	\$ 900,000.00	\$900,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$5,000	
Clearing and Grubbing	1	LS	\$ 100,000.00	\$100,000	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 50,000.00	\$50,000	
Right-of-Way Acquisition	55,042	SF	\$ 15.00	\$825,630	
Miscellaneous Subtotal =				\$2,274,830	
Road Construction					
Construct Type 8 Integral Curb and Gutter	5,500	LF	\$ 19.00	\$ 104,500	
Construct 4" PCC Sidewalk	127,000	SF	\$ 5.95	\$ 755,650	
Construct 8" Median Curb	5,300	LF	\$ 15.00	\$ 79,500	
Construct PCC Paving in Medians	8,000	SF	\$ 5.95	\$ 47,600	Assume 18" band
Construct Curb Ramps	13	EA	\$ 2,390.00	\$ 31,070	
Subgrade Preparation	88,000	SF	\$ 0.36	\$ 31,680	Top 6" of Soil
1-1/2" Cold Mill (\$35,000 + \$0.80/SF)	165,500	SF	\$ 0.80	\$ 132,400	
Construct 1-1/2" Overlay Asphalt Pavement	165,500	SF	\$ 0.90	\$ 148,950	
Construct 5" Asphalt Pavement/Aggregate Base (5"/6")	88,000	SF	\$ 4.00	\$ 352,000	Full Depth
Construct Commercial Driveway	3,500	SF	\$ 10.75	\$ 37,625	
Construct Residential Driveway	400	SF	\$ 10.75	\$ 4,300	
Construct Cross Gutter	4	EA	\$ 5,000.00	\$ 20,000	
Construct Parkway Culvert	3	EA	\$ 1,500.00	\$ 4,500	
Road Construction Subtotal =				\$ 1,749,775	
Utility Improvements					
Adjust Sewer Manhole to Grade	1	EA	\$ 800.00	\$800	
Adjust Unknown Manhole to Grade	3	EA	\$ 800.00	\$2,400	
Adjust Vault to Grade	1	EA	\$ 3,000.00	\$3,000	
Adjust Water Valve to Grade	3	EA	\$ 500.00	\$1,500	
Relocate Manhole	2	EA	\$ 5,000.00	\$10,000	
Relocate Power Pole	9	EA	\$ -	\$0	SCE will handle the cost of relocation
Relocate Guy Wire	5	EA	\$ 15,000.00	\$75,000	
Relocate Street Light	2	EA	\$ 6,810.00	\$13,620	
Relocate Fire Hydrant	4	EA	\$ 3,000.00	\$12,000	
Relocate Vent	3	EA	\$ 10,000.00	\$30,000	
Relocate Vault	0	EA	\$ 5,000.00	\$0	
Relocate Cabinet	0	EA	\$ 5,000.00	\$0	
Relocate Mailbox	0	EA	\$ 300.00	\$0	
Construct Catch Basin - 7'	4	EA	\$ 6,240.00	\$24,960	
Construct Catch Basin - 14'	2	EA	\$ 11,350.00	\$22,700	
Construct Local Depression	6	EA	\$ 1,192.00	\$7,152	
Construct Concrete Collar	6	EA	\$ 2,980.00	\$17,880	
Construct 18" RCP	0	LF	\$ 113.50	\$0	
Utility Subtotal =				\$221,012	
Rail Improvements					
Relocate Rail Signals	2	EA	\$ 250,000.00	\$ 500,000	
Relocate Rail Bungalow	1	EA	\$ 50,000.00	\$ 50,000	
Rail Subtotal =				\$550,000	
Landscaping and Irrigation Improvements					
Median Landscaping	2,631	LF	\$ 100.00	\$ 263,100	No Street Trees or Parkway Landscaping
Median Irrigation	2,631	LF	\$ 75.00	\$ 197,325	
Landscaping Subtotal =				\$460,425	
Signing and Striping Improvement					
Signing and Striping including Overhead Pedestrian Crossing Signals	1	LS	\$ 210,000.00	\$ 210,000	
Signing and Striping Subtotal =				\$210,000	
Subtotal =				\$5,466,042	
Contingency (15%) =				\$819,900	
CONSTRUCTION TOTAL =				\$6,285,900	
DESIGN TOTAL (20% OF Construction Costs) =				\$1,257,200	
TOTAL =				\$7,543,100	
Non Rialto R/W (25%)				\$1,885,775	
GRAND TOTAL				\$5,657,325	



CITY OF RIALTO
Base Line between Palmetto and Laurel (3960 LF)
Preliminary Opinion on Probable Project Cost

P S O M A S

Preparer(s): Lisette Bice
Reviewer: Arief Naftali

Date Updated: 08/09/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 200,000.00	\$200,000	
Construction Survey	1	LS	\$ 50,000.00	\$50,000	
Construction Management & Inspection	1	LS	\$ 164,000.00	\$164,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 70,000.00	\$70,000	
Clearing and Grubbing	1	LS	\$ 40,000.00	\$40,000	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 40,000.00	\$40,000	
Right-of-Way Acquisition	76,978	SF	\$ 15.00	\$1,154,670	
Miscellaneous Subtotal =				\$1,762,870	
Road Construction					
Construct Type 8 Integral Curb and Gutter	8,000	LF	\$ 19.00	\$ 152,000	
Construct 4" PCC Sidewalk	80,000	SF	\$ 5.95	\$ 476,000	
Construct 8" Median Curb	8,000	LF	\$ 15.00	\$ 120,000	
Construct PCC Paving in Medians	6,000	SF	\$ 5.95	\$ 35,700	Assume 18" band
Construct Curb Ramps	14	EA	\$ 2,390.00	\$ 33,460	
Subgrade Preparation	125,000	SF	\$ 0.36	\$ 45,000	Top 6" of Soil
1-1/2" Cold Mill (\$35,000 + \$0.80/SF)	256,000	SF	\$ 0.80	\$ 204,800	
Construct 1-1/2" Overlay Asphalt Pavement	256,000	SF	\$ 0.90	\$ 230,400	
Construct 5" Asphalt Pavement/Aggregate Base (5"/6")	125,000	SF	\$ 4.00	\$ 500,000	Full Depth
Construct Commercial Driveway	0	SF	\$ 10.75	\$ -	
Construct Residential Driveway	2,000	SF	\$ 10.75	\$ 21,500	
Construct Cross Gutter	2	EA	\$ 5,000.00	\$ 10,000	
Construct Parkway Culvert	1	EA	\$ 1,500.00	\$ 1,500	
Road Construction Subtotal =				\$ 1,830,360	
Utility Improvements					
Adjust Sewer Manhole to Grade	9	EA	\$ 800.00	\$7,200	
Adjust Unknown Manhole to Grade	2	EA	\$ 800.00	\$1,600	
Adjust Vault to Grade	0	EA	\$ 3,000.00	\$0	
Adjust Water Valve to Grade	3	EA	\$ 500.00	\$1,500	
Relocate Manhole	0	EA	\$ 5,000.00	\$0	
Relocate Power Pole	24	EA	\$ -	\$0	SCE will handle the cost of the relocation
Relocate Guy Wire	3	EA	\$ 15,000.00	\$45,000	
Relocate Street Light	0	EA	\$ 6,810.00	\$0	
Relocate Fire Hydrant	1	EA	\$ 3,000.00	\$3,000	
Relocate Vent	0	EA	\$ 10,000.00	\$0	
Relocate Vault	0	EA	\$ 5,000.00	\$0	
Relocate Cabinet	1	EA	\$ 5,000.00	\$5,000	
Relocate Mailbox	10	EA	\$ 300.00	\$3,000	
Relocate Pull Box	0	EA	\$ 700.00	\$0	
Construct Catch Basin - 7'	0	EA	\$ 6,240.00	\$0	
Construct Catch Basin - 14'	0	EA	\$ 11,350.00	\$0	
Construct Local Depression	0	EA	\$ 1,192.00	\$0	
Construct Concrete Collar	0	EA	\$ 2,980.00	\$0	
Construct 18" RCP	0	LF	\$ 113.50	\$0	
Utility Subtotal =				\$66,300	
Rail Improvements					
Relocate Rail Signals	0	EA	\$ 250,000.00	\$ -	
Relocate Rail Bungalow	0	EA	\$ 50,000.00	\$ -	
Rail Subtotal =				\$0	
Landscaping and Irrigation Improvements					
Median Landscaping	3,960	LF	\$ 100.00	\$ 396,000	No Street Trees or Parkway Landscaping
Median Irrigation	3,960	LF	\$ 75.00	\$ 297,000	Mainline, conduit, POV
Landscaping Subtotal =				\$693,000	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 70,000.00	\$ 70,000	
Signing and Striping Subtotal =				\$70,000	
Subtotal =				\$4,422,530	
Contingency (15%) =				\$663,400	
CONSTRUCTION TOTAL =				\$5,085,900	
DESIGN TOTAL (20% of Construction Costs) =				\$1,017,180	
GRAND TOTAL =				\$6,103,080	



CITY OF RIALTO
Riverside between I-10 and Agua Mansa (2 mi)
Preliminary Opinion on Probable Project Cost

PSOMAS

Preparer(s): Lisette Bice
Reviewer: Arief Naftali

Date Updated: 08/09/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 800,000.00	\$800,000	
Construction Survey	1	LS	\$ 150,000.00	\$150,000	
Construction Management & Inspection	1	LS	\$ 3,000,000.00	\$3,000,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 7,000.00	\$7,000	
Clearing and Grubbing	1	LS	\$ 500,000.00	\$500,000	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 90,000.00	\$90,000	
Right-of-Way Acquisition	140,643	SF	\$ 15.00	\$2,109,645	
Miscellaneous Subtotal =				\$6,700,845	
Road Construction					
Construct Type 8 Integral Curb and Gutter	22,000	LF	\$ 19.00	\$ 418,000	
Construct 4" PCC Sidewalk	253,440	SF	\$ 5.95	\$ 1,507,968	
Construct 8" Median Curb	21,500	LF	\$ 15.00	\$ 322,500	
Construct PCC Paving in Medians	16,000	SF	\$ 5.95	\$ 95,200	Assume 18" band
Construct Curb Ramps	21	EA	\$ 2,390.00	\$ 50,190	
Subgrade Preparation	225,500	SF	\$ 0.36	\$ 81,180	Top 6" of Soil
1-1/2" Cold Mill (\$35,000 + \$0.80/SF)	789,000	SF	\$ 0.80	\$ 631,200	
Construct 1-1/2" Overlay Asphalt Pavement	789,000	SF	\$ 0.90	\$ 710,100	
Construct 5" Asphalt Pavement/Aggregate Base (5"/6")	225,500	SF	\$ 4.00	\$ 902,000	Full Depth
Construct Commercial Driveway	17,000	SF	\$ 10.75	\$ 182,750	
Construct Residential Driveway	0	SF	\$ 10.75	\$ -	
Construct Cross Gutter	1	EA	\$ 5,000.00	\$ 5,000	
Construct Parkway Culvert	3	EA	\$ 1,500.00	\$ 4,500	
Construct Retaining Wall	575	LF	\$ 100.00	\$ 57,500	
Wide Overpass	15,000	SF	\$ 1,000.00	\$ 15,000,000	
Road Construction Subtotal =				\$ 19,968,088	
Utility Improvements					
Adjust Sewer Manhole to Grade	0	EA	\$ 800.00	\$0	
Adjust Unknown Manhole to Grade	0	EA	\$ 800.00	\$0	
Adjust Vault to Grade	0	EA	\$ 3,000.00	\$0	
Adjust Water Valve to Grade	3	EA	\$ 500.00	\$1,500	
Relocate Manhole	0	EA	\$ 5,000.00	\$0	
Relocate Power Pole	52	EA	\$ -	\$0	SCE will cover the cost of the relocation
Relocate Guy Wire	19	EA	\$ 15,000.00	\$285,000	
Relocate Water Meter	19	EA	\$ 500.00	\$9,500	
Relocate Street Light	21	EA	\$ 6,810.00	\$143,010	
Relocate Fire Hydrant	32	EA	\$ 3,000.00	\$96,000	
Relocate Vent	0	EA	\$ 10,000.00	\$0	
Relocate Vault	0	EA	\$ 5,000.00	\$0	
Relocate Cabinet	0	EA	\$ 5,000.00	\$0	
Relocate Mailbox	3	EA	\$ 300.00	\$900	
Relocate Pull Box	21	EA	\$ 700.00	\$14,700	
Construct Catch Basin - 7'	0	EA	\$ 6,240.00	\$0	
Construct Catch Basin - 14'	11	EA	\$ 11,350.00	\$124,850	
Construct Local Depression	11	EA	\$ 1,192.00	\$13,112	
Construct Concrete Collar	11	EA	\$ 2,980.00	\$32,780	
Construct 18" RCP	165	LF	\$ 113.50	\$18,728	
Utility Subtotal =				\$740,080	
Rail Improvements					
Relocate Rail Signals	0	EA	\$ 250,000.00	\$ -	
Relocate Rail Bungalow	0	EA	\$ 50,000.00	\$ -	
Rail Subtotal =				\$0	
Landscaping and Irrigation Improvements					
Median Landscaping	10,560	LF	\$ 100.00	\$ 1,056,000	No Street Trees or Parkway Landscaping
Median Irrigation	10,560	LF	\$ 75.00	\$ 792,000	Mainline, conduit, POV
Landscaping Subtotal =				\$1,848,000	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 40,000.00	\$ 40,000	
Signing and Striping Subtotal =				\$40,000	
Subtotal =				\$29,297,013	
Contingency (15%) =				\$4,394,600	
CONSTRUCTION TOTAL =				\$33,691,600	
DESIGN TOTAL (20% of Construction Costs) =				\$6,738,320	
GRAND TOTAL =				\$40,429,920	



CITY OF RIALTO
Pepper between Base Line and Highland (5280 LF)
Preliminary Opinion on Probable Project Cost

P S O M A S

Preparer(s): Lisette Bice
Reviewer: Arief Naftali

Date Updated: 08/09/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 20,000.00	\$15,000	
Construction Survey	1	LS	\$ 50,000.00	\$50,000	
Construction Management & Inspection	1	LS	\$ 60,000.00	\$60,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$5,000	
Clearing and Grubbing	1	LS	\$ 50,000.00	\$50,000	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 10,000.00	\$10,000	
Right-of-Way Acquisition	0	SF	\$ 15.00	\$0	
Miscellaneous Subtotal =				\$234,200	
Road Construction					
Construct Type 8 Integral Curb and Gutter		LF	\$ 19.00	\$ -	
Construct 4" PCC Sidewalk		SF	\$ 5.95	\$ -	
Construct 8" Median Curb	10,560	LF	\$ 15.00	\$ 158,400	
Construct PCC Paving in Medians	15,840	SF	\$ 5.95	\$ 94,248	Assume 18" band
Construct Curb Ramps		EA	\$ 2,390.00	\$ -	
Subgrade Preparation	68,640	SF	\$ 0.36	\$ 24,710	Top 6" of Soil
1-1/2" Cold Mill (\$35,000 + \$0.80/SF)		SF	\$ 0.80	\$ -	
Construct 1-1/2" Overlay Asphalt Pavement		SF	\$ 0.90	\$ -	
Construct 5" Asphalt Pavement/Aggregate Base (5"/6")		SF	\$ 4.00	\$ -	Full Depth
Construct Commercial Driveway	0	SF	\$ 10.75	\$ -	
Construct Residential Driveway	0	SF	\$ 10.75	\$ -	
Construct Cross Gutter	0	EA	\$ 5,000.00	\$ -	
Construct Parkway Culvert	0	EA	\$ 1,500.00	\$ -	
Road Construction Subtotal =				\$ 277,358	
Utility Improvements					
Adjust Sewer Manhole to Grade	0	EA	\$ 800.00	\$0	
Adjust Unknown Manhole to Grade	0	EA	\$ 800.00	\$0	
Adjust Vault to Grade	0	EA	\$ 3,000.00	\$0	
Adjust Water Valve to Grade	6	EA	\$ 500.00	\$3,000	
Relocate Manhole	0	EA	\$ 5,000.00	\$0	
Relocate Power Pole	0	EA	\$ -	\$0	
Relocate Guy Wire	0	EA	\$ 15,000.00	\$0	
Relocate Street Light	0	EA	\$ 6,810.00	\$0	
Relocate Fire Hydrant	0	EA	\$ 3,000.00	\$0	
Relocate Vent	0	EA	\$ 10,000.00	\$0	
Relocate Vault	0	EA	\$ 5,000.00	\$0	
Relocate Cabinet	0	EA	\$ 5,000.00	\$0	
Relocate Mailbox	0	EA	\$ 300.00	\$0	
Construct Catch Basin - 7'	0	EA	\$ 6,240.00	\$0	
Construct Catch Basin - 14'	0	EA	\$ 11,350.00	\$0	
Construct Local Depression	0	EA	\$ 1,192.00	\$0	
Construct Concrete Collar	0	EA	\$ 2,980.00	\$0	
Construct 18" RCP	0	LF	\$ 113.50	\$0	
Utility Subtotal =				\$3,000	
Rail Improvements					
Relocate Rail Signals	0	EA	\$ 250,000.00	\$ -	
Relocate Rail Bungalow	0	EA	\$ 50,000.00	\$ -	
Rail Subtotal =				\$0	
Landscaping and Irrigation Improvements					
Median Landscaping	5,280	LF	\$ 100.00	\$ 528,000	No Street Trees or Parkway Landscaping
Median Irrigation	5,280	LF	\$ 75.00	\$ 396,000	Mainline, conduit, POV
Landscaping Subtotal =				\$924,000	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 32,000.00	\$ 32,000	
Signing and Striping Subtotal =				\$32,000	
Subtotal =				\$1,470,558	
Contingency (15%) =				\$220,600	
CONSTRUCTION TOTAL =				\$1,691,200	
DESIGN TOTAL (20% OF Construction Costs) =				\$338,200	
TOTAL =				\$2,029,400	



CITY OF RIALTO

Sierra between I-15NB and Riverside Avenue (700 LF)
Preliminary Opinion on Probable Project Cost

P S O M A S

Preparer(s): Lisette Bice
Reviewer: Arief Naftali

Date Updated: 11/18/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 100,000.00	\$100,000	
Construction Survey	1	LS	\$ 50,000.00	\$50,000	
Construction Management & Inspection	1	LS	\$ 200,000.00	\$200,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$5,000	
Clearing and Grubbing	1	LS	\$ 22,000.00	\$22,000	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 25,000.00	\$25,000	
Right-of-Way Acquisition	14,000	SF	\$ 15.00	\$210,000	
Miscellaneous Subtotal =				\$ 656,200	
Road Construction					
Construct Type 8 Integral Curb and Gutter	1,460	LF	\$ 19.00	\$ 27,740	
Construct 4" PCC Sidewalk	17,520	SF	\$ 5.95	\$ 104,244	
Construct Driveway		SF	\$ 10.75		
Construct 8" Median Curb	1,460	LF	\$ 15.00	\$ 21,900	
Construct PCC Paving in Medians	2,190	SF	\$ 5.95	\$ 13,031	Assume 18" band
Subgrade Preparation	30,800	SF	\$ 0.36	\$ 11,088	Top 6" of Soil
1-1/2" Cold Mill (\$35,000 + \$0.80/SF)	14,000	SF	\$ 0.80	\$ 11,200	
Construct 1-1/2" Overlay Asphalt Pavement	14,000	SF	\$ 0.90	\$ 12,600	
Construct 5" Asphalt Pavement/Aggregate Base (5"/6")	30,800	SF	\$ 4.00	\$ 123,200	Full Depth
Road Construction Subtotal =				\$ 325,003	
Utility Improvements					
Relocate Street Light	1	EA	\$ 6,810.00	\$ 6,810	
Relocate Power Pole	3	EA	\$ -	\$ -	SCE will handle the cost of relocation
Relocate Guy Wire	1	EA	\$ 15,000.00	\$ 15,000	
Relocate Cabinet	1	EA	\$ 5,000.00	\$ 5,000	
Utility Subtotal Subtotal =				\$26,810	
Landscaping and Irrigation Improvements					
Median Landscaping	2,382	LF	\$ 100.00	\$ 238,200	No Street Trees or Parkway Landscaping
Median Irrigation	2,382	LF	\$ 75.00	\$ 178,650	
Utility Subtotal Subtotal =				\$416,850	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 20,000.00	\$ 20,000	
Subtotal =				\$1,444,863	
Contingency (15%) =				\$216,700	
CONSTRUCTION TOTAL =				\$1,661,600	
DESIGN TOTAL (20% of Construction Costs) =				\$332,300	
GRAND TOTAL =				\$1,993,900	
50% OF COSTS TO BE SHARED WITH THE CITY OF FONTANA					
CITY OF RIALTO GRAND TOTAL =				\$996,950	



CITY OF RIALTO
Alder between Renaissance and Base Line (5280 LF)
Preliminary Opinion on Probable Project Cost

P S O M A S

Preparer(s): Lisette Bice
Reviewer: Arief Naftali

Date Updated: 08/09/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 400,000.00	\$400,000	
Construction Survey	1	LS	\$ 50,000.00	\$50,000	
Construction Management & Inspection	1	LS	\$ 400,000.00	\$400,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$5,000	
Clearing and Grubbing	1	LS	\$ 90,000.00	\$90,000	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 40,000.00	\$40,000	
Right-of-Way Acquisition	214,988	SF	\$ 15.00	\$3,224,820	
Miscellaneous Subtotal =				\$4,209,820	
Road Construction					
Construct Type 8 Integral Curb and Gutter	10,560	LF	\$ 19.00	\$ 200,640	
Construct 4" PCC Sidewalk	254,000	SF	\$ 5.95	\$ 1,511,300	
Construct 8" Median Curb	0	LF	\$ 15.00	\$ -	
Construct PCC Paving in Medians	8,500	SF	\$ 5.95	\$ 50,575	Assume 18" band
Construct Curb Ramps	10	EA	\$ 2,390.00	\$ 23,900	
Subgrade Preparation	323,500	SF	\$ 0.36	\$ 116,460	Top 6" of Soil
1-1/2" Cold Mill (\$35,000 + \$0.80/SF)	184,000	SF	\$ 0.80	\$ 147,200	
Construct 1-1/2" Overlay Asphalt Pavement	184,000	SF	\$ 0.90	\$ 165,600	
Construct 5" Asphalt Pavement/Aggregate Base (5"/6")	323,500	SF	\$ 4.00	\$ 1,294,000	Full Depth
Construct Commercial Driveway	800	SF	\$ 10.75	\$ 8,600	
Construct Residential Driveway	700	SF	\$ 10.75	\$ 7,525	
Construct Cross Gutter	1	EA	\$ 5,000.00	\$ 5,000	
Construct Parkway Culvert	0	EA	\$ 1,500.00	\$ -	
Relocate Bus Shelter	0	EA	\$ 15,000.00	\$ -	
Widen Overpass	0	SF	\$ 1,000.00	\$ -	
Road Construction Subtotal =				\$ 3,530,800	
Utility Improvements					
Adjust Sewer Manhole to Grade	5	EA	\$ 800.00	\$4,000	
Adjust Unknown Manhole to Grade	0	EA	\$ 800.00	\$0	
Adjust Vault to Grade	0	EA	\$ 3,000.00	\$0	
Adjust Water Valve to Grade	3	EA	\$ 500.00	\$1,500	
Relocate Manhole	0	EA	\$ 5,000.00	\$0	
Relocate Power Pole	23	EA	\$ -	\$0	SCE will handle the cost of the relocation
Relocate Guy Wire	3	EA	\$ 15,000.00	\$45,000	
Relocate Water Meter	1	EA	\$ 500.00	\$500	
Relocate Street Light	2	EA	\$ 6,810.00	\$13,620	
Relocate Fire Hydrant	1	EA	\$ 3,000.00	\$3,000	
Relocate Vent	2	EA	\$ 10,000.00	\$20,000	
Relocate Vault	0	EA	\$ 5,000.00	\$0	
Relocate Cabinet	0	EA	\$ 5,000.00	\$0	
Relocate Mailbox	10	EA	\$ 300.00	\$3,000	
Relocate Pull Box	0	EA	\$ 700.00	\$0	
Construct Catch Basin - 7'	0	EA	\$ 6,240.00	\$0	
Construct Catch Basin - 14'	0	EA	\$ 11,350.00	\$0	
Construct Local Depression	0	EA	\$ 1,192.00	\$0	
Construct Concrete Collar	0	EA	\$ 2,980.00	\$0	
Construct 18" RCP	0	LF	\$ 113.50	\$0	
Utility Subtotal =				\$90,620	
Rail Improvements					
Relocate Rail Signals	0	EA	\$ 250,000.00	\$ -	
Relocate Rail Bungalow	0	EA	\$ 50,000.00	\$ -	
Rail Subtotal =				\$0	
Landscaping and Irrigation Improvements					
Median Landscaping	0	LF	\$ 100.00	\$ -	No Street Trees or Parkway Landscaping
Median Irrigation	0	LF	\$ 75.00	\$ -	Mainline, conduit, POV
Landscaping Subtotal =				\$0	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 20,000.00	\$ 20,000	
Signing and Striping Subtotal =				\$20,000	
Subtotal =				\$7,851,240	
Contingency (15%) =				\$1,177,700	
CONSTRUCTION TOTAL =				\$9,028,900	
DESIGN TOTAL (20% OF Construction Costs) =				\$1,805,800	
DESIGN TOTAL =				\$10,834,700	



CITY OF RIALTO
Ayala between Renaissance and Base Line (5000 LF)
Preliminary Opinion on Probable Project Cost

P S O M A S

Preparer(s): Lisette Bice
Reviewer: Arief Naftali

Date Updated: 06/08/15

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	\$ 300,000.00	\$300,000	
Construction Survey	1	LS	\$ 310,000.00	\$310,000	
Construction Management & Inspection	1	LS	\$ 900,000.00	\$900,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	\$ 5,000.00	\$5,000	
Clearing and Grubbing	1	LS	\$ 240,000.00	\$240,000	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	\$ 75,000.00	\$75,000	
Right-of-Way Acquisition	57,260	SF	\$ 15.00	\$858,900	
Miscellaneous Subtotal =				\$2,733,100	
Road Construction					
Construct Type 8 Integral Curb and Gutter	10,000	LF	\$ 19.00	\$ 190,000	
Construct 4" PCC Sidewalk	240,500	SF	\$ 5.95	\$ 1,430,975	
Construct 8" Median Curb	10,000	LF	\$ 15.00	\$ 150,000	
Construct PCC Paving in Medians	15,500	SF	\$ 5.95	\$ 92,225	Assume 18" band
Construct Curb Ramps	13	EA	\$ 2,390.00	\$ 31,070	
Subgrade Preparation	225,000	SF	\$ 0.36	\$ 81,000	Top 6" of Soil
1-1/2" Cold Mill (\$35,000 + \$0.80/SF)	255,500	SF	\$ 0.80	\$ 204,400	
Construct 1-1/2" Overlay Asphalt Pavement	255,500	SF	\$ 0.90	\$ 229,950	
Construct 5" Asphalt Pavement/Aggregate Base (5"/6")	225,000	SF	\$ 4.00	\$ 900,000	Full Depth
Construct Commercial Driveway	4,500	SF	\$ 10.75	\$ 48,375	
Construct Residential Driveway	0	SF	\$ 10.75	\$ -	
Construct Cross Gutter	0	EA	\$ 5,000.00	\$ -	
Construct Parkway Culvert	0	EA	\$ 1,500.00	\$ -	
Road Construction Subtotal =				\$ 3,357,995	
Utility Improvements					
Adjust Sewer Manhole to Grade	10	EA	\$ 800.00	\$8,000	
Adjust Unknown Manhole to Grade	1	EA	\$ 800.00	\$800	
Adjust Vault to Grade	0	EA	\$ 3,000.00	\$0	
Adjust Water Valve to Grade	3	EA	\$ 500.00	\$1,500	
Relocate Manhole	0	EA	\$ 5,000.00	\$0	
Relocate Power Pole	0	EA	\$ -	\$0	
Relocate Guy Wire	0	EA	\$ 15,000.00	\$0	
Relocate Water Meter	13	EA	\$ 500.00	\$6,500	
Relocate Street Light	5	EA	\$ 6,810.00	\$34,050	
Relocate Fire Hydrant	7	EA	\$ 3,000.00	\$21,000	
Relocate Vent	2	EA	\$ 10,000.00	\$20,000	
Relocate Vault	0	EA	\$ 5,000.00	\$0	
Relocate Cabinet	3	EA	\$ 5,000.00	\$15,000	
Relocate Mailbox	0	EA	\$ 300.00	\$0	
Relocate Pull Box	0	EA	\$ 700.00	\$0	
Construct Catch Basin - 7'	0	EA	\$ 6,240.00	\$0	
Construct Catch Basin - 14'	0	EA	\$ 11,350.00	\$0	
Construct Local Depression	0	EA	\$ 1,192.00	\$0	
Construct Concrete Collar	0	EA	\$ 2,980.00	\$0	
Construct 18" RCP	20	LF	\$ 113.50	\$2,270	
Utility Subtotal =				\$109,120	
Rail Improvements					
Relocate Rail Signals	0	EA	\$ 250,000.00	\$ -	
Relocate Rail Bungalow	0	EA	\$ 50,000.00	\$ -	
Rail Subtotal =				\$0	
Landscaping and Irrigation Improvements					
Median Landscaping	3,600	LF	\$ 100.00	\$ 360,000	No Street Trees or Parkway Landscaping
Median Irrigation	3,600	LF	\$ 75.00	\$ 270,000	Mainline, conduit, POV
Landscaping Subtotal =				\$630,000	
Signing and Striping Improvement					
Signing and Striping	1	LS	\$ 32,000.00	\$ 32,000	
Signing and Striping Subtotal =				\$32,000	
Subtotal =				\$6,862,215	
Contingency (15%) =				\$1,029,300	
CONSTRUCTION TOTAL =				\$7,891,500	
DESIGN TOTAL (20% of Construction Costs) =				\$1,578,300	
GRAND TOTAL =				\$9,469,800	

APPENDIX E: FAIR SHARE CALCULATION SHEETS

Fair-Share Calculation of Intersection Improvements with an existing deficiency

Intersection (with existing deficiency)	Peak Hour	Existing Peak Hour Vols	2040 Peak Hour Vols	Peak Hour Vols attributed to new development	New Development Fair- Share %	Full Improvement Cost Estimate	Fair-share Cost
Alder Ave/Base Line Rd	AM	2,195	3,689	1,494	40.5%	\$597,600	\$242,002
	PM	1,862	3,657	1,795	49.1%	\$597,600	\$293,263

Max cost of both peak hours --> **\$293,263**

Fair-Share Calculation of Roadway Improvements with an existing deficiency

Roadway (with existing deficiency)	Existing ADT	2040 ADT (post-processed)	2040 Peak Hour Vols	New Development Fair-Share %	Full Improvement Cost Estimate	Fair-share Cost
Alder Ave between Renaissance Pkwy and Base Line Rd	15,983	20,553	4,570	22.2%	\$10,834,700	\$2,409,075
Ayala Ave between Renaissance Pkwy and Base Line Rd	23,488	25,163	1,675	6.7%	\$9,469,800	\$630,355

Total --> \$3,039,430