APPENDIX A:

SCOPING LETTER

URBAN CROSSROADS

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Memorandum

DATE: Revised May 6, 2013

TO: Jeff Harvey, William Tam

FROM: John Kain, AICP; Marlie Whiteman, PE

RE: SCOPING OF ATHENS SERVICES MATERIALS RECOVERY FACILITY AND TRANSFER STATION TIA (2013), AND SITE PLAN REVIEW

Review of Previous TIA Submittal

On March 6, 2013 a conference call was held between City of Irwindale, Urban Crossroads, and Harvey-Meyerhoff staff to discuss the project and the July 2012 Transportation Analysis for the Athens Services Materials Recovery Facility and Transfer Station prepared by Gibson Transportation Consulting, Inc. Conference call participants included William Tam, Jeff Harvey, Elizabeth Meyerhoff, and Carleton Waters (UC). Among the items discussed:

- Peak of generator is much lower than data used in the 2009 UC traffic study prepared for a previous land use plan at this site. William Tam requested that we verify the information provided by Athens or use other objective data sources.
- Annual growth rate difference (0.46% per year in the July 2012 TIA compared with 2% per year in guidelines).
- Mitigation / Improvements were discussed with respect to fair share funding or condition to construct.
- William Tam indicated that City has been actively pursuing improvements at the freeway interchanges.
- Elizabeth Meyerhoff indicated that the project includes a General Plan Amendment, so long range analysis will be necessary.
- July 2012 TIA had added some intersections to the east as a result of adding the Vincent at Arrow Hwy location for truck parking. However, this site is no longer part of the project proposal. Original study area will generally be used.
- Jeff Harvey mentioned the need for a qualitative analysis of an alternative which has water tanks occupying 2.5 acres on the eastern end of the project site. This would be a “project variance scenario.”
- Jeff Harvey noted that the updated site plan will be needed from the applicant before final scoping of the environmental analysis.

Project Trip Generation

The project site plan for the Athens Services Materials Recovery Facility and Transfer Station is shown on Exhibit 1. Project buildout is anticipated to occur in 2016.

Project trip generation rates have been developed from empirical data collected by Urban Crossroads Inc. at various locations in southern California. The data is contained in Attachment 1. Attachment 1 also includes calculations performed by Urban Crossroads, Inc. staff to evaluate trip generation patterns and develop trip generation rates for each truck type. The empirical data includes truck axle counts for facilities of various sizes, so the weighted average trip rate was calculated. Because no indication was given regarding tons per day (TPD) by truck type, the rate is dependent on total TPD for the site.

Trip generation rates proposed for use in the project analysis are shown on Table 1. Trip rates were developed for truck trips (by number of axles) and employees, in addition to the convenience store with gas pumps. These rates have been used to calculate project trip generation (see Table 2).

Study Area

The proposed study area is shown on Exhibit 2. The proposed intersection analysis locations are listed on Table 3. Seventeen intersections are recommended for analysis, including the two site driveways to Arrow Highway. The third site driveway will also be analyzed as the north leg of the intersection of Baldwin Park Boulevard at Live Oak Avenue.

Project Trip Distribution

Project trip distribution patterns have been developed for each truck type, along with employee trip distribution and convenience store / gas trip distribution. Exhibits 3 and 4 show inbound and outbound trip distribution patterns for Self Haul / Contractor trucks, respectively. These 2-axle trucks will use Driveway 1 to enter the site and Driveway 2 to exit the site.

Trip distribution patterns for Collection trucks (including Packer, End Dump and Roll-off trucks) are shown on Exhibits 5 (inbound) and 6 (outbound). They will enter and exit the site through Driveway 1.

Transfer truck inbound and outbound trip distributions are shown on Exhibits 7 and 8, respectively. Transfer trucks will use Driveway 1 to enter and exit the site. Recyclable Loadout trucks comprise a portion of Transfer trucks, but have their own trip distribution patterns at the driveways. These recyclable loadout (4-axle) trucks enter the site through Driveway 1 and exit through Driveway 2.

Employee (passenger car) trip distribution patterns are shown on Exhibits 9 (inbound) and 10 (outbound). Employee vehicles use Driveway 3 (the north leg of the intersection of Baldwin Park Boulevard at Arrow Highway).

Inbound and outbound trip distributions for the convenience store with gas pumps are shown on Exhibits 11 and 12, respectively.

Access Evaluation / Site Plan Inputs

Access to the project site has been reviewed, and initial site access recommendations have been developed. Exhibit 13 shows the preliminary site access recommendations:

- For Driveway 1, install new traffic signal to accommodate large trucks entering and exiting at this driveway. Configure access to main driveway for 2 inbound lanes and 2 outbound lanes. The outbound lanes are 1 left and 1 right turn lane. Eliminate the small driveway immediately adjacent to Driveway 1.
- Construct 28' internal access driveway connecting the MRF main driveway (Driveway 1) to the convenience store with gas pumps.
- West of Driveway 1, provide right turn in/out only access with a stop sign for the outbound lane.
- Driveway 2 should provide two lanes inbound for trucks to access the MRF facility, and also 1 inbound and 1 outbound lane for the convenience store with gas pumps.
- Modify the traffic signal at the existing intersection of Baldwin Park Boulevard and Live Oak Avenue to accommodate Driveway 3 as the north leg of the intersection.
- Widen Driveway 3 to accommodate two outbound lanes (one through-right turn lane, and one left turn lane), as well as one inbound lane.
- Provide 100 foot eastbound left turn lane on the west leg of the Baldwin Park Boulevard and Live Oak Avenue intersection.

Existing Conditions Data

Existing lanes throughout the study area have been reviewed. The characteristics of the site's surrounding roadway network has been examined to verify the existing number of lanes, traffic signal locations, intersection configurations, and other visible factors which may have to be analyzed. Exhibit 14 documents the existing (2013) number of through lanes and intersection controls.

Existing AM and PM peak hour traffic volumes are taken from the 2012 study, and have been summarized on Exhibits 15 and 16, respectively. Urban Crossroads, Inc. proposes to collect Existing Daily Traffic Volumes (up to six new traffic counts). If necessary, these 2013 counts will be used to adjust the 2011 peak hour counts from the Gibson traffic study.

Proposed Analysis Scenarios

An evaluation of existing conditions (using the data described above) will be performed. A comparison will be conducted of the "Existing Conditions" against an "Existing Conditions plus Proposed Project". The purpose of this analysis is to provide a baseline for assessing traffic impacts of the project buildout in comparison to the existing conditions.

For interim (opening) year conditions, the proposed project will be evaluated as compared to without project conditions. The projected opening year is 2016. Ambient growth will be calculated using 2% per year, as indicated in the City of Irwindale Traffic Impact Analysis Policy Guidelines.

Long range horizon year analysis without and with the project is proposed as well. Ambient growth will consider both ambient growth assumptions and CMP criteria.

Analysis Criteria

Highway Capacity Manual (HCM) analysis will be performed for study area intersections. For signalized intersections, average total delay per vehicle for the overall intersection is used to determine level of service. Levels of service at the study intersections will be evaluated using an HCM intersection analysis program. The level of service will be determined at signalized intersections using data collected describing the intersection configuration, traffic signal timing, and traffic volumes to calculate average intersection delay.

The study area intersections which are stop sign controlled with stop-control on the minor street only will be analyzed using the two-way stop-controlled unsignalized intersection analysis methodology of the HCM. For these intersections, the calculation of level of service is dependent on the occurrence of gaps occurring in the traffic flow of the major street. The level of service criteria for this type of intersection analysis is based on total delay per vehicle for the worst minor street movement(s).

A saturation flow rate of 1,900 vehicles per hour of green (vphg) per lane will be utilized in each scenario. The signalized study area intersections will also be analyzed using the Intersection Capacity Utilization (ICU) technique. To calculate an ICU, the volume of traffic using the intersection is compared with the capacity of the intersection. ICU is usually expressed as a volume to capacity (V/C) ratio. The V/C represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. For unsignalized study area intersections, explicit ICU volume to capacity ratios cannot be calculated.

Urban segments (i.e., segments on roadways that are generally signalized) do not typically require segment analysis. Segment requirements can normally be determined by the analysis of lane requirements at intersections.

Definition of Deficiency

The City of Irwindale requires the following LOS criteria be implemented:

- LOS will not exceed LOS “D” at all intersections (excluding State Highway facilities) on arterial and collector streets.
- For State Highway facilities, the threshold is LOS “E”, consistent with the criteria used by the Los Angeles Congestion Management Program (CMP) for freeway mainline sections and freeway ramps.

Definition of Significant Impact

- When a signalized intersection operates at mid-range LOS “D” (45.0 seconds) or better under existing or future baseline conditions, and the

addition of project trips degrades the intersection operations to LOS “E” or “F”. The project mitigation should bring the facility to operate at mid-range LOS “D” at minimum.

- When a signalized intersection operates at mid-range LOS “E” (67.5 seconds) for State Highways or better under existing or future baseline conditions, and the addition of project trips degrades the intersection operations to 67.6 seconds (LOS “E”) or worse (LOS “F”). The project mitigation should bring the facility to operate at mid-range LOS “E” at minimum.

- When a signalized intersection operates at LOS “E” for non-state or LOS “F” (for State) under existing or future baseline conditions, and the addition of more than 50 peak hour project trips contributes to the continuing operational failure at the intersection. The project mitigation should bring the facility to pre-project conditions.

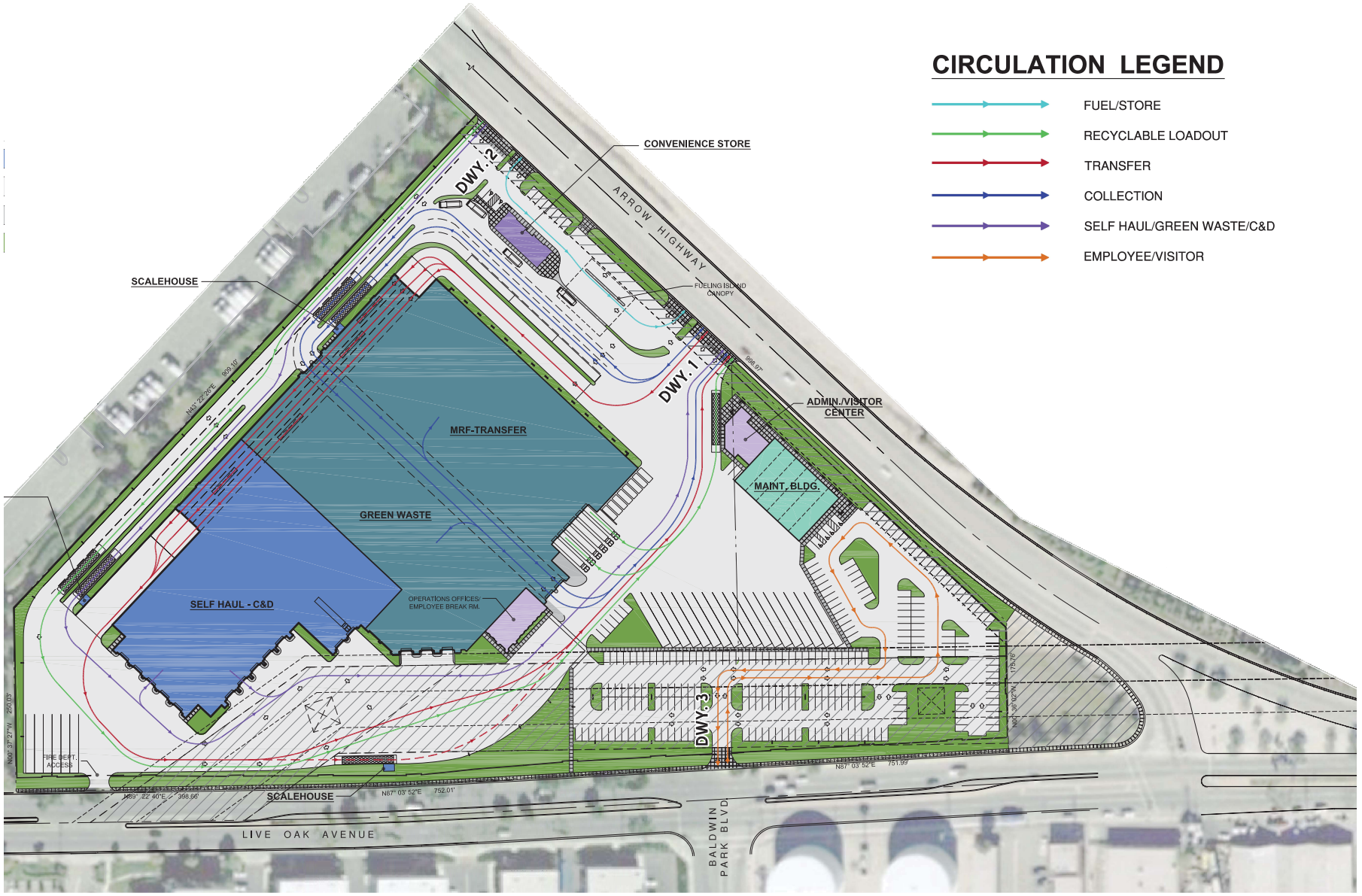
- At an unsignalized intersection, when the minor stop-controlled approach operates at LOS **“F”** and does not have acceptable operation in terms of total control delay, and the addition of project trips increases the total control delay to more than 4.0 vehicle hours for a single lane approach or 5.0 vehicle hours for a multi-lane approach. The project mitigation should bring the facility to operate at LOS “E” (at a minimum) or bring the total control delay to less than 4.0 vehicle-hours for a single lane approach or 5.0 vehicle-hours for a multi-lane approach (at a minimum).

- At an unsignalized intersection, when the minor stop controlled approach operates at LOS **“F”** and does not have an acceptable operation in terms of total control delay, and the addition of more than 50 peak hour project trips contributes to the continuing operational failure at the minor approach. The project mitigation should bring the facility to pre-project conditions.

For freeway analysis, the CMP requires analysis where the project will add 150 or more trips in either direction, during the AM or PM weekday peak hours. Based upon the trip generation calculations and trip distribution patterns identified in this scoping letter, analysis of freeway ramp merge / diverge and mainline performance may not be necessary.

EXHIBIT 1

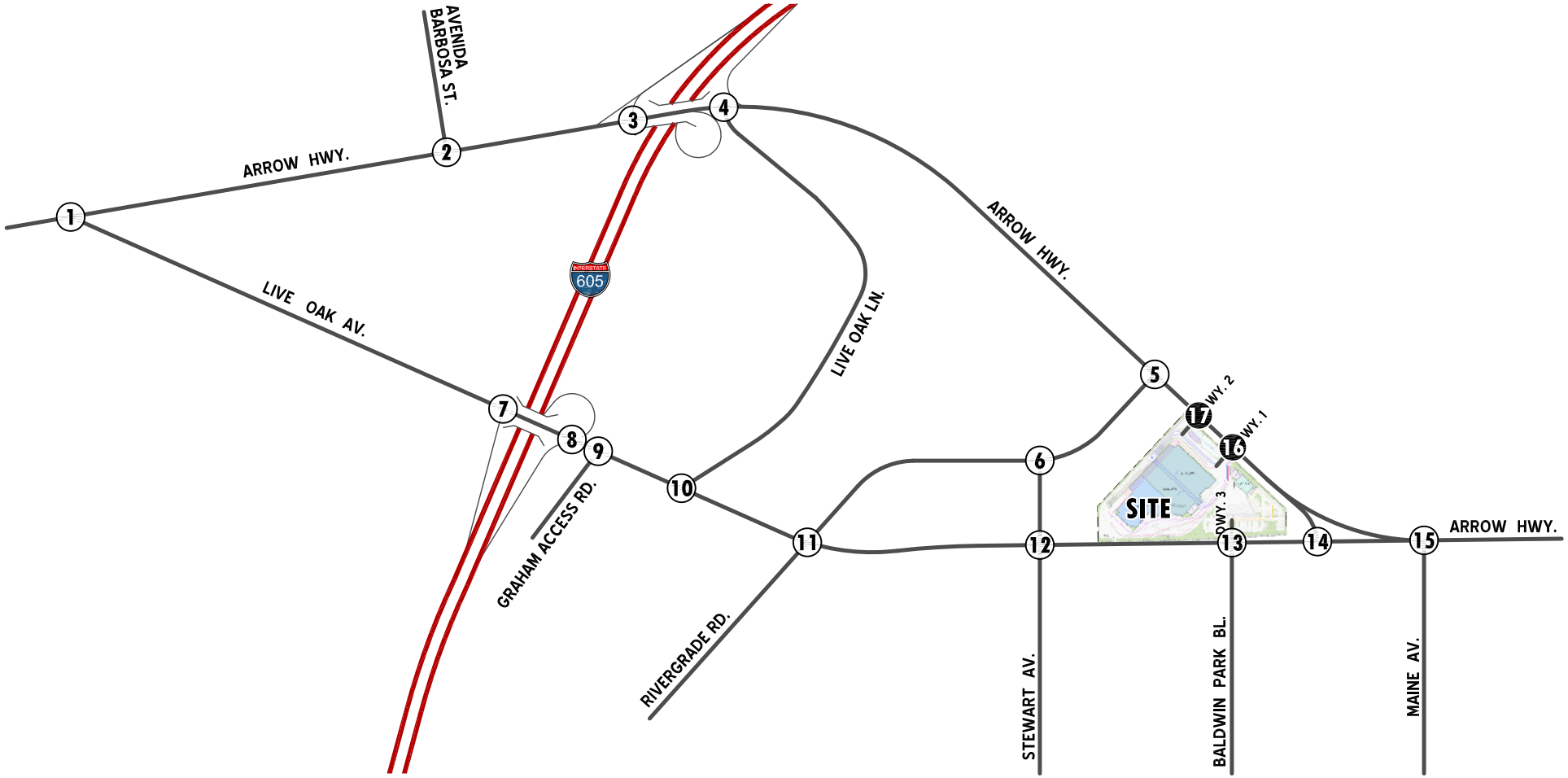
SITE PLAN



A-6

EXHIBIT 2

LOCATION MAP



A-7

LEGEND:

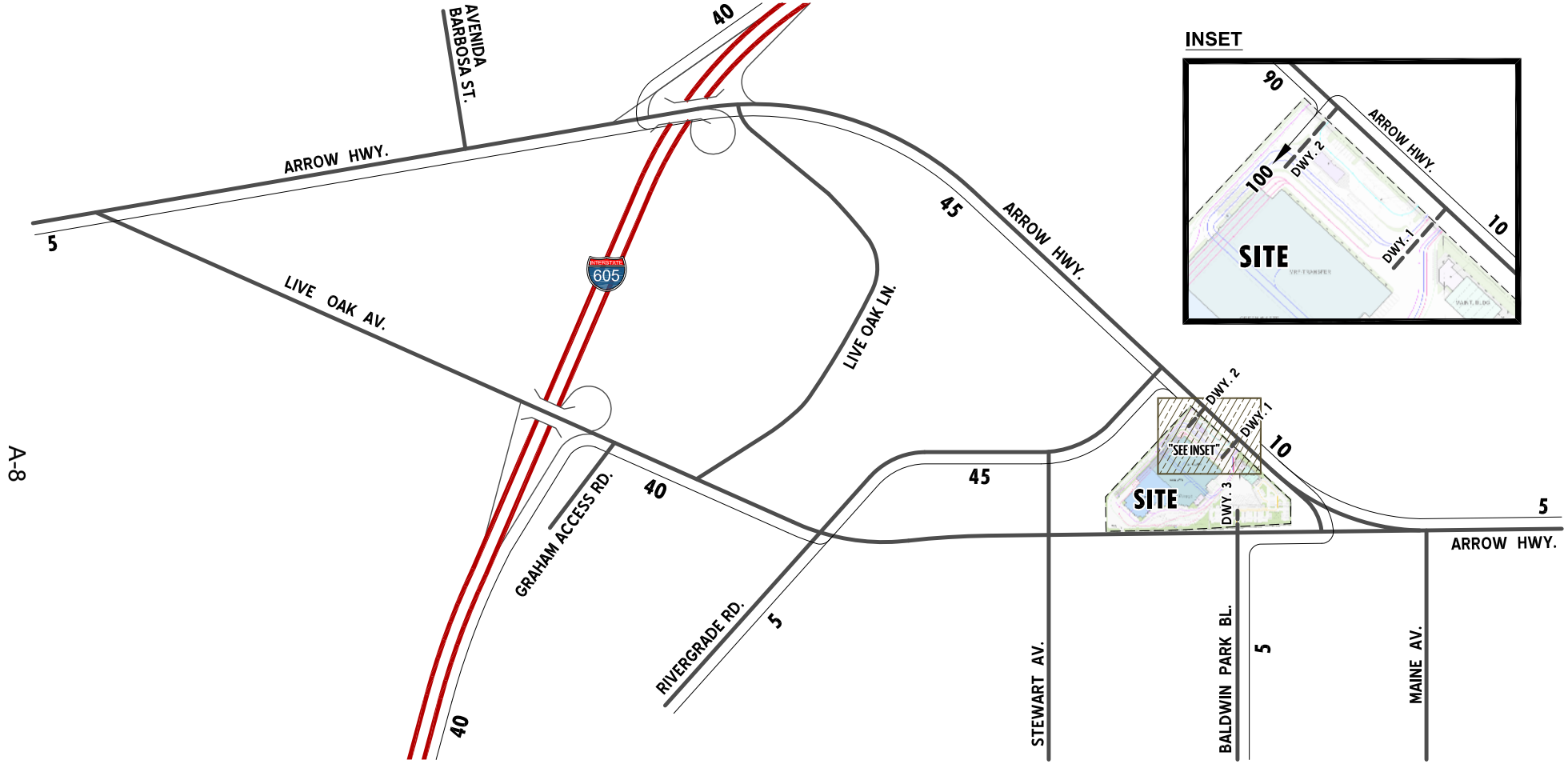
15 = EXISTING INTERSECTION ANALYSIS LOCATION

2 = FUTURE INTERSECTION ANALYSIS LOCATION

N

EXHIBIT 3

SELF HAUL/CONTRACTOR TRUCK INBOUND TRIP DISTRIBUTION



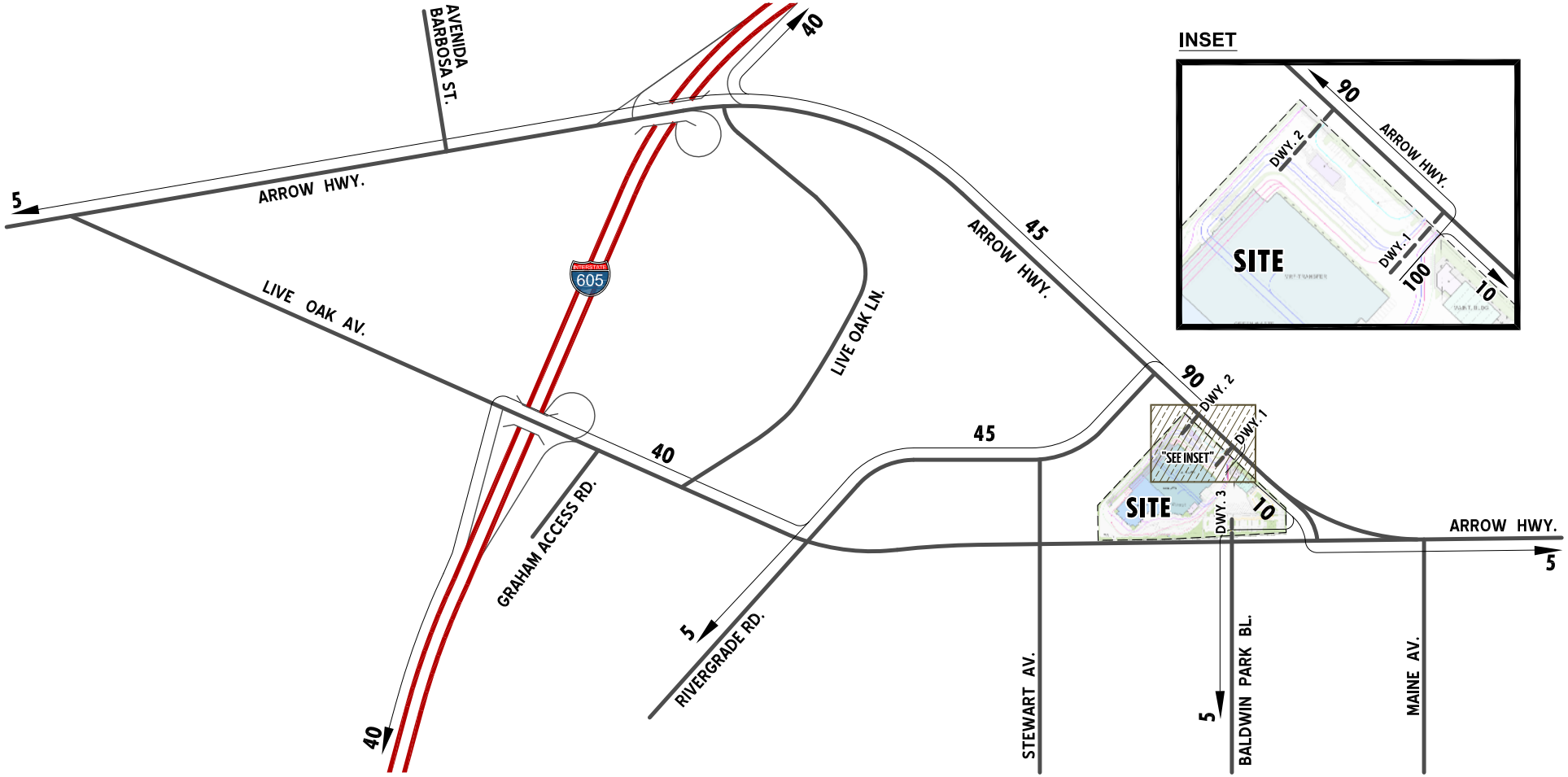
LEGEND:

10 = PERCENT TO PROJECT

N

EXHIBIT 4

SELF HAUL/CONTRACTOR TRUCK OUTBOUND TRIP DISTRIBUTION



A-9

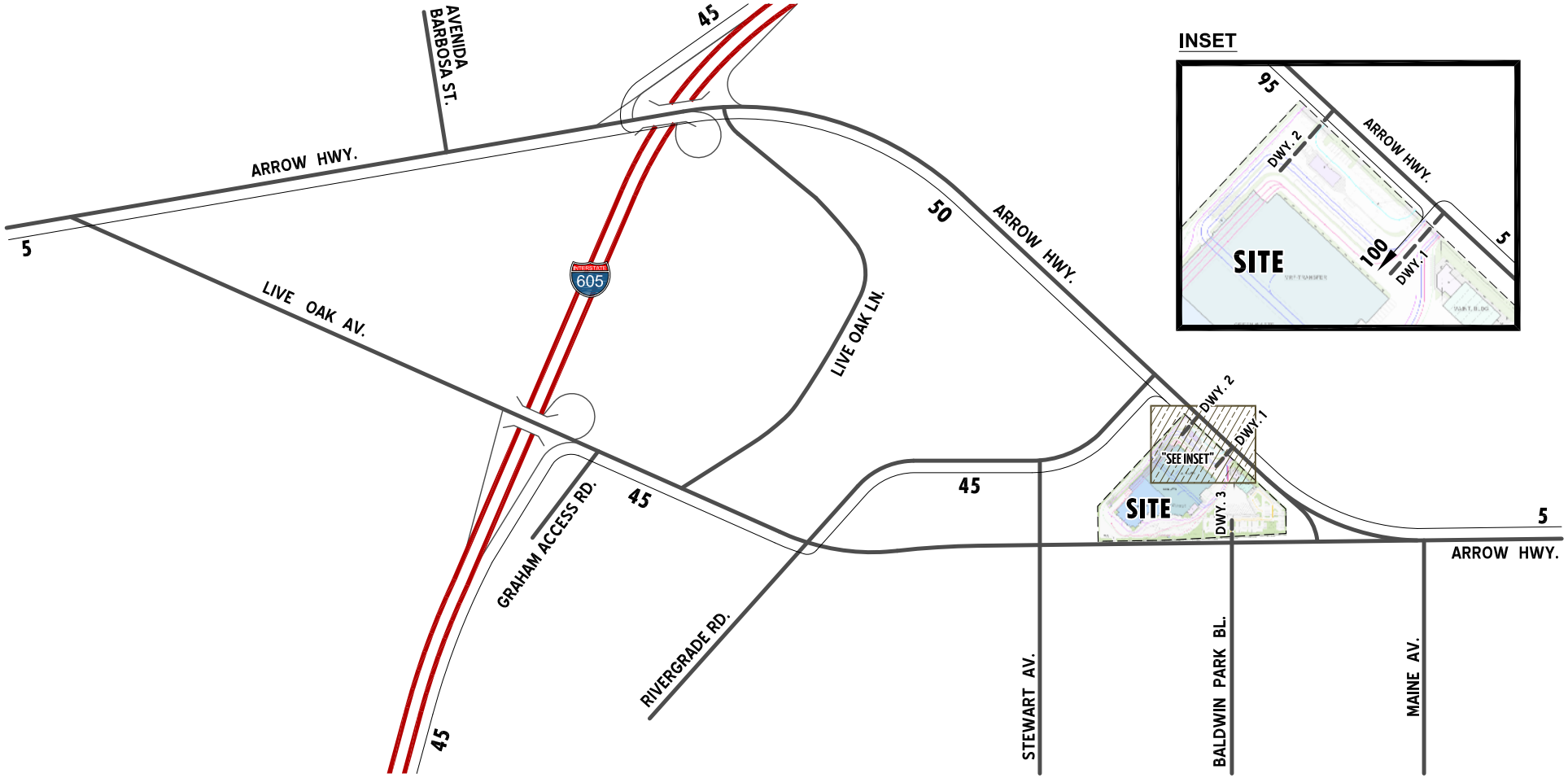
LEGEND:

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EXHIBIT 5

COLLECTION TRUCK (INCLUDING PACKER, END DUMP & ROLL-OFF TRUCKS) INBOUND TRIP DISTRIBUTION



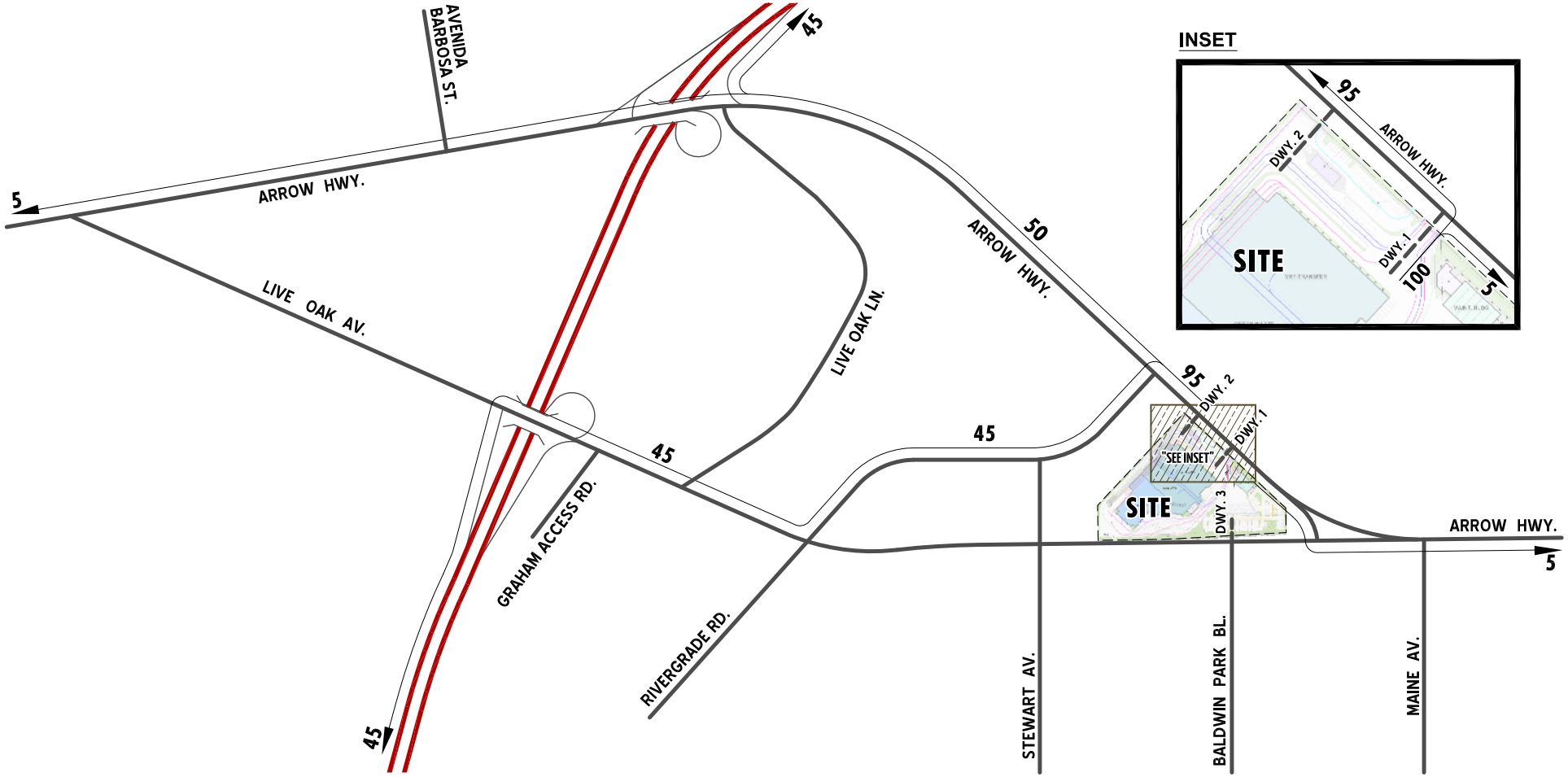
LEGEND:

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EXHIBIT 6

COLLECTION TRUCK (INCLUDING PACKER, END DUMP & ROLL-OFF TRUCKS) OUTBOUND TRIP DISTRIBUTION



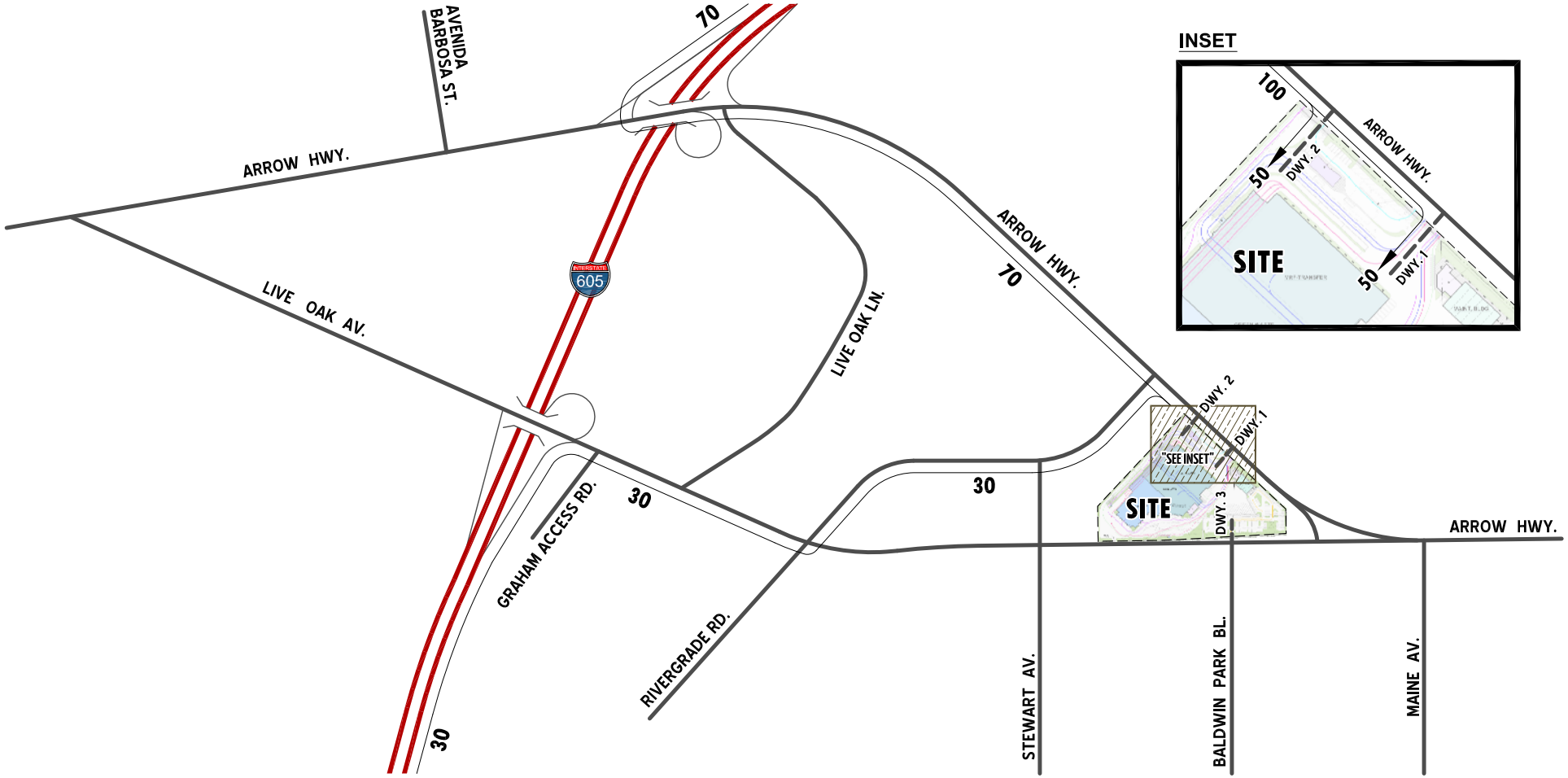
LEGEND:

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EXHIBIT 7

TRANSFER & RECYCLABLE LOADOUT TRUCKS INBOUND TRIP DISTRIBUTION



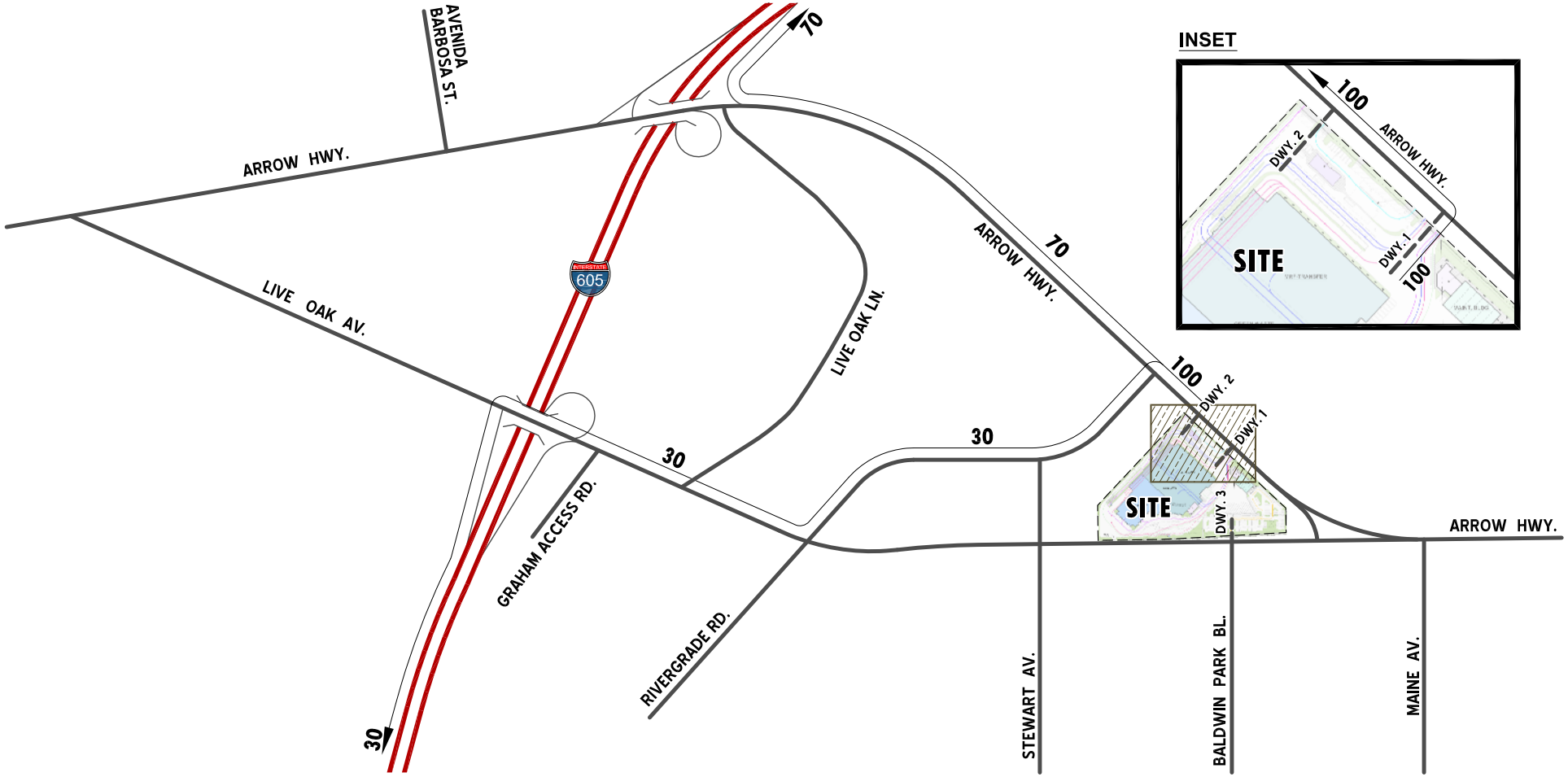
LEGEND:

10 = PERCENT TO PROJECT

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EXHIBIT 8

TRANSFER & RECYCLABLE LOADOUT TRUCKS OUTBOUND TRIP DISTRIBUTION



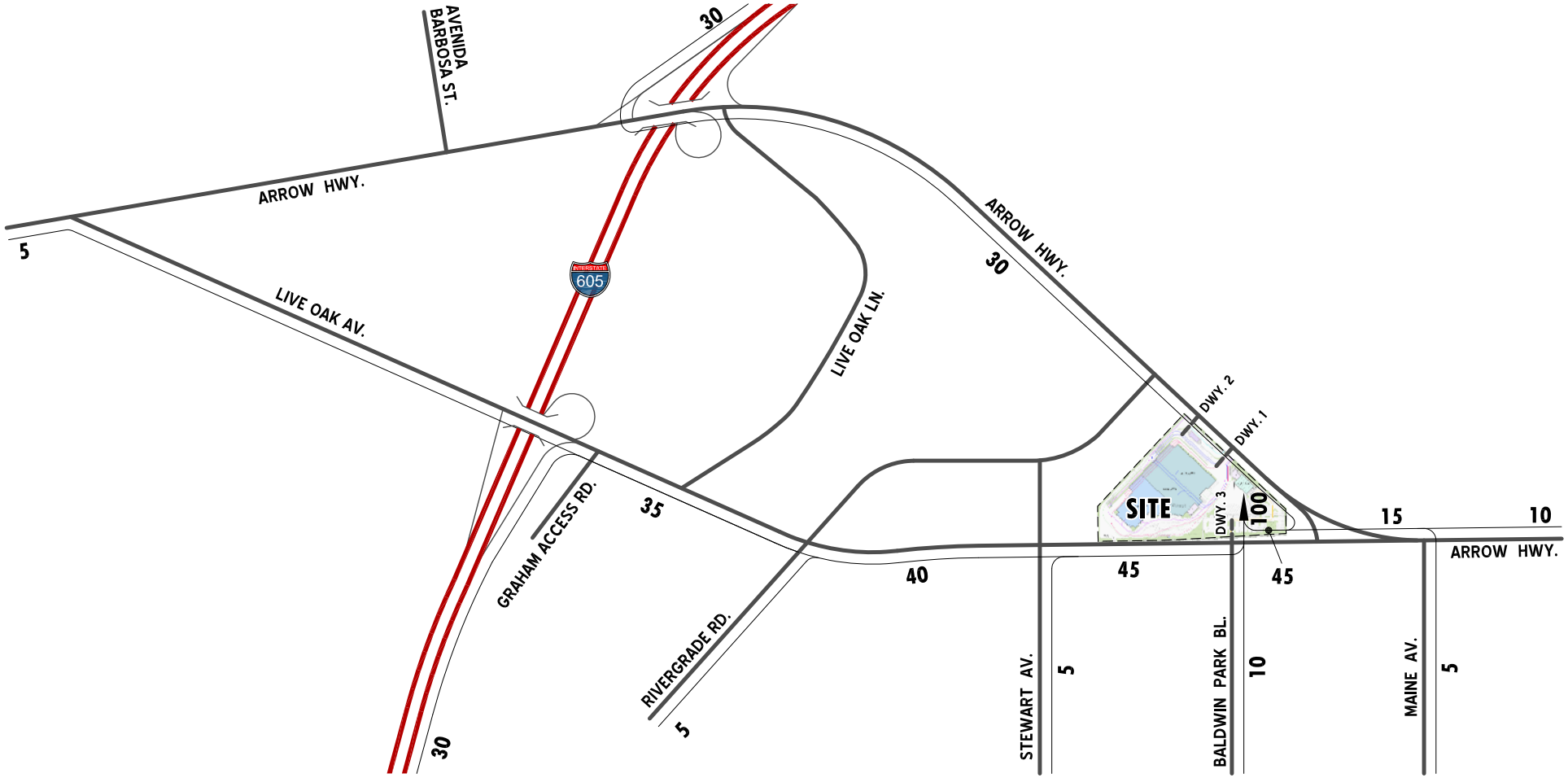
LEGEND:

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EXHIBIT 9

EMPLOYEE (PASSENGER CAR) INBOUND TRIP DISTRIBUTION



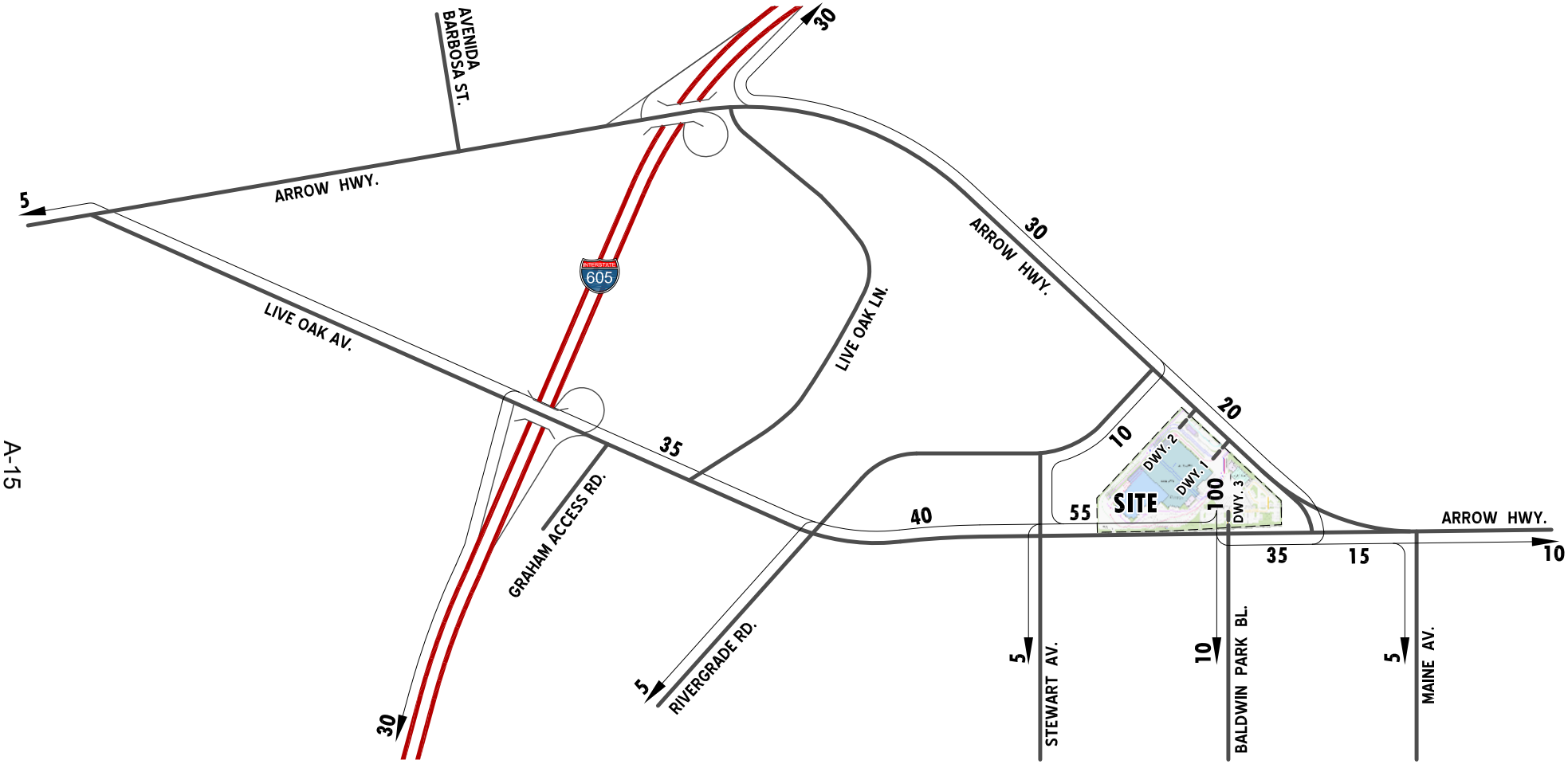
LEGEND:

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EXHIBIT 10

EMPLOYEE (PASSENGER CAR) OUTBOUND TRIP DISTRIBUTION



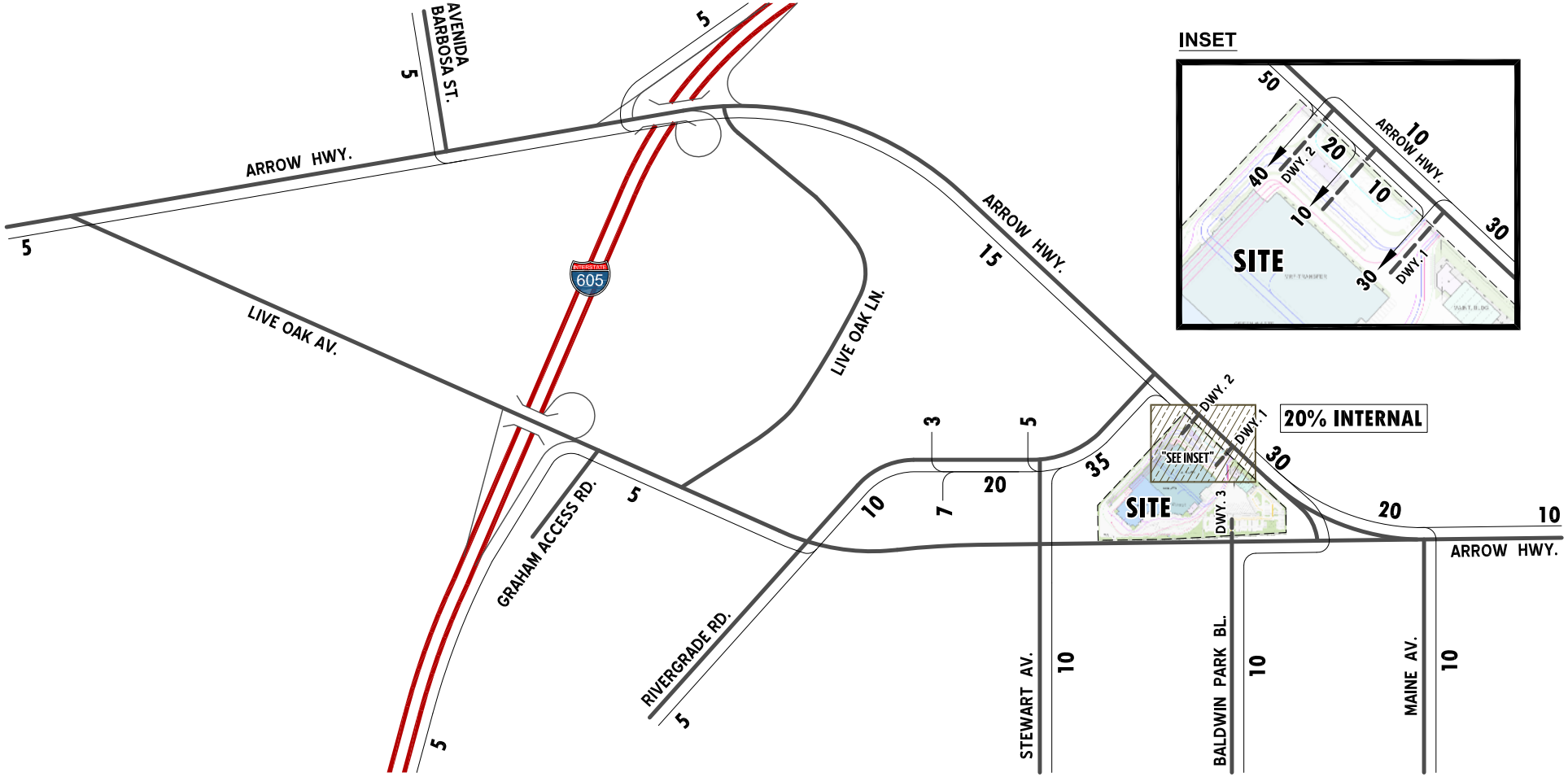
LEGEND:

10 = PERCENT FROM PROJECT

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EXHIBIT 11

CONVENIENCE STORE/FUELING FACILITY
INBOUND TRIP DISTRIBUTION



LEGEND:

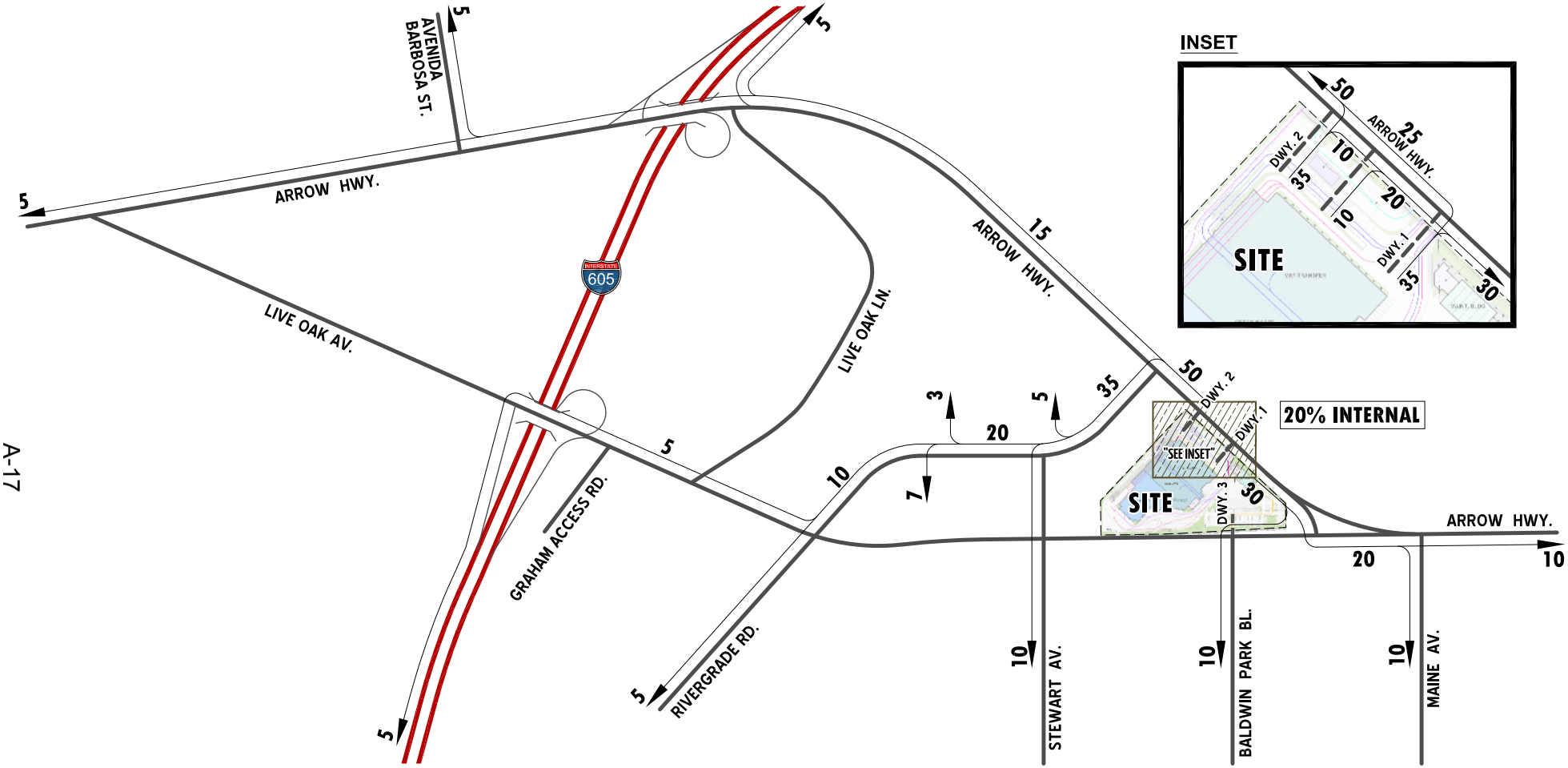
10 = PERCENT TO PROJECT

NOTE: TRIP DISTRIBUTION APPLIES TO ADDED TRIPS, NOT PASS-BY TRIPS WHICH ARE ALREADY ON THE ROADWAY SYSTEM.

N

EXHIBIT 12

CONVENIENCE STORE/FUELING FACILITY OUTBOUND TRIP DISTRIBUTION



LEGEND:

10 = PERCENT FROM PROJECT

NOTE: TRIP DISTRIBUTION APPLIES TO ADDED TRIPS, NOT PASS-BY TRIPS WHICH ARE ALREADY ON THE ROADWAY SYSTEM.

N

EXHIBIT 13

SITE ACCESS RECOMMENDATIONS

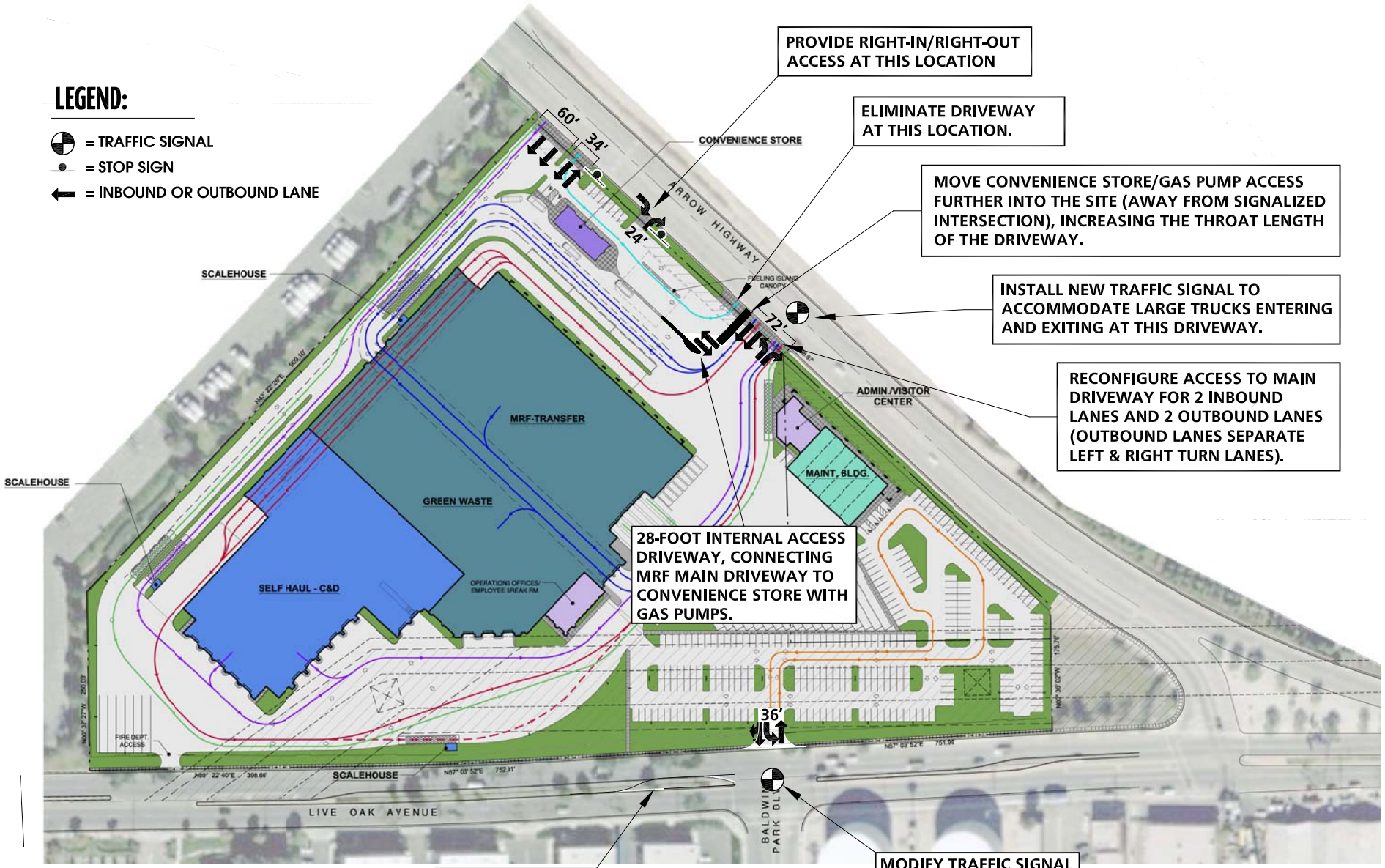
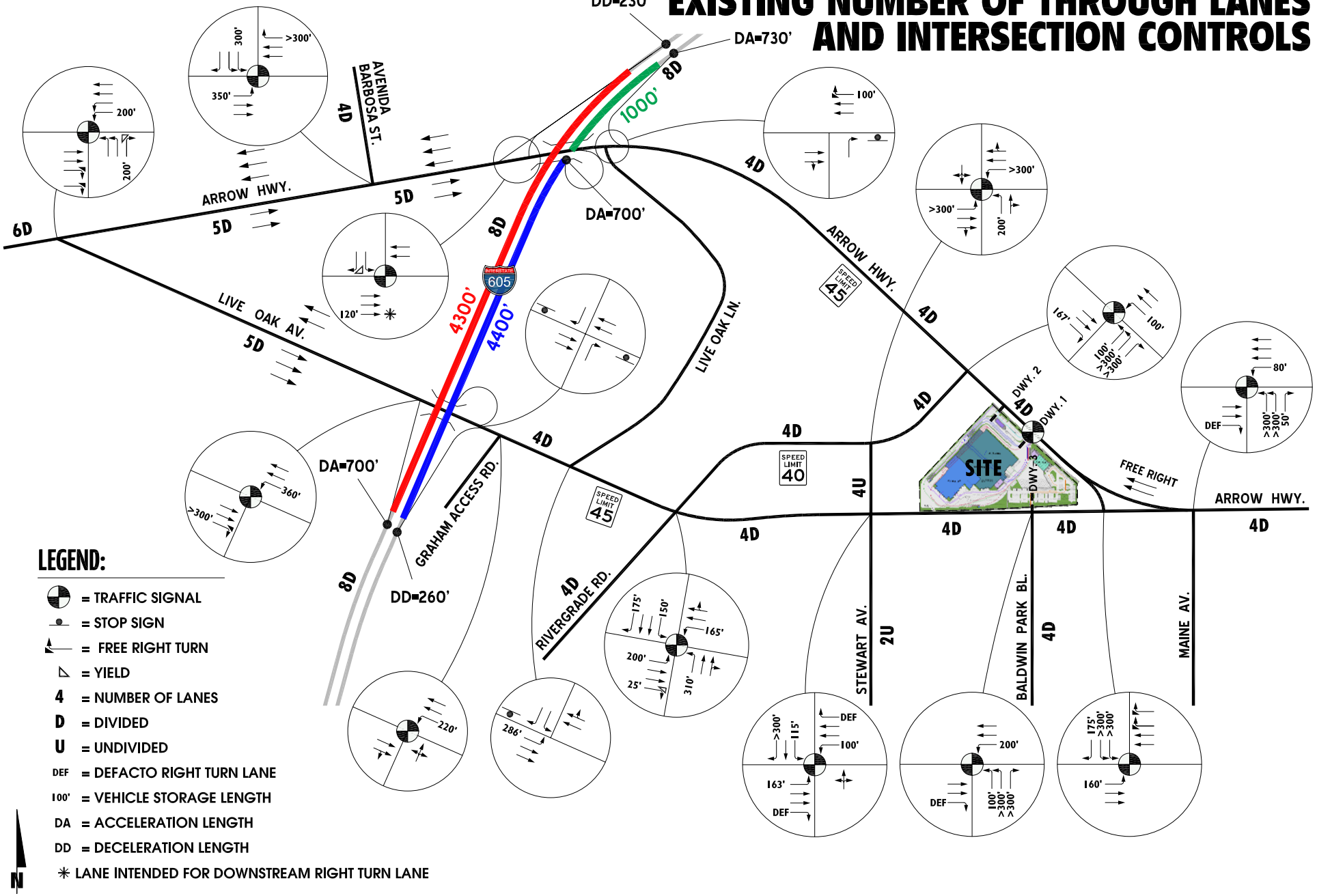


EXHIBIT 14

EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



LEGEND:

- = TRAFFIC SIGNAL
- = STOP SIGN
- = FREE RIGHT TURN
- = YIELD
- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- DEF = DEFACTO RIGHT TURN LANE
- 100' = VEHICLE STORAGE LENGTH
- DA = ACCELERATION LENGTH
- DD = DECELERATION LENGTH
- ✳ LANE INTENDED FOR DOWNSTREAM RIGHT TURN LANE

N

EXHIBIT 15

EXISTING AM PEAK HOUR INTERSECTION VOLUMES

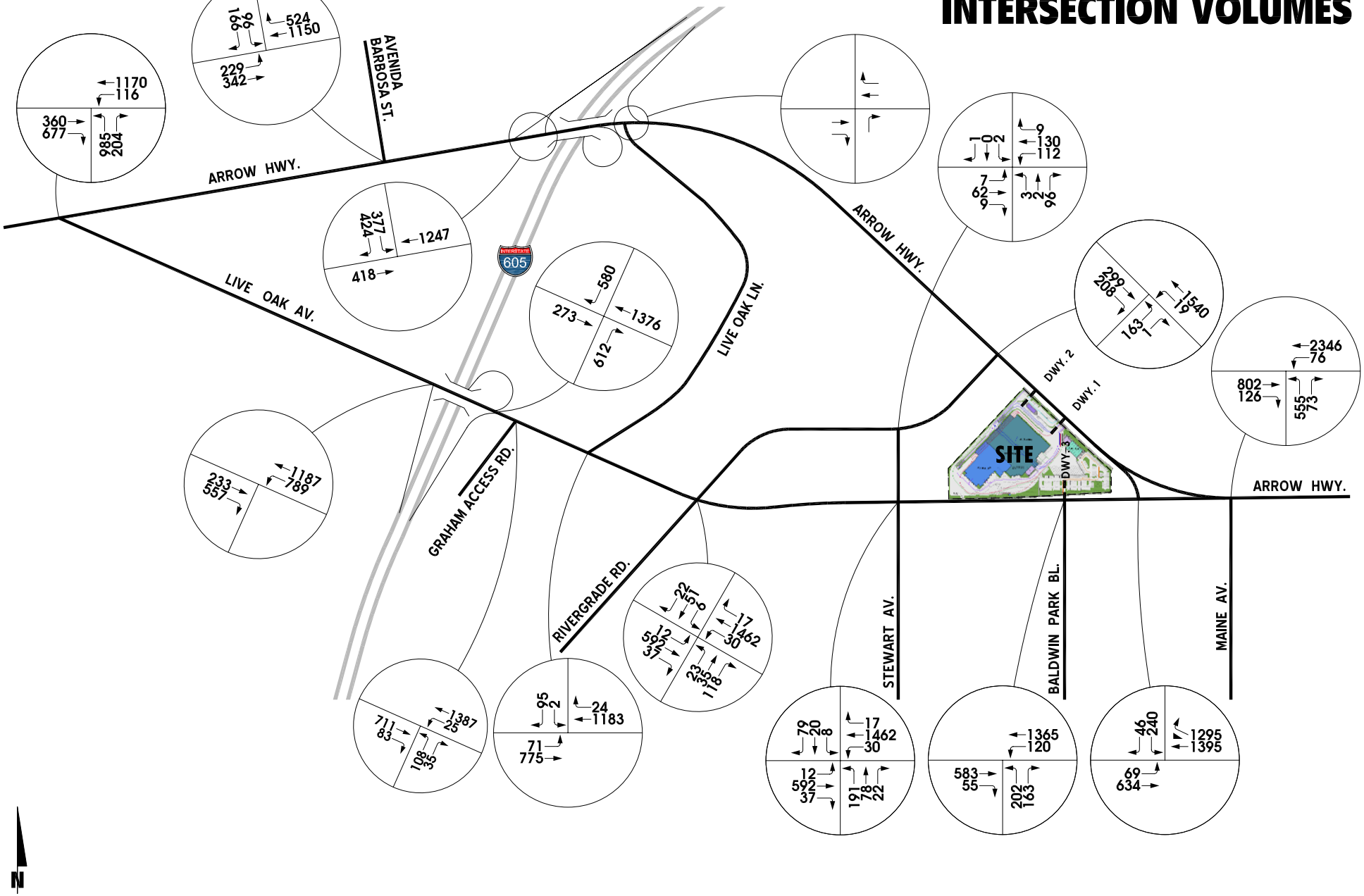
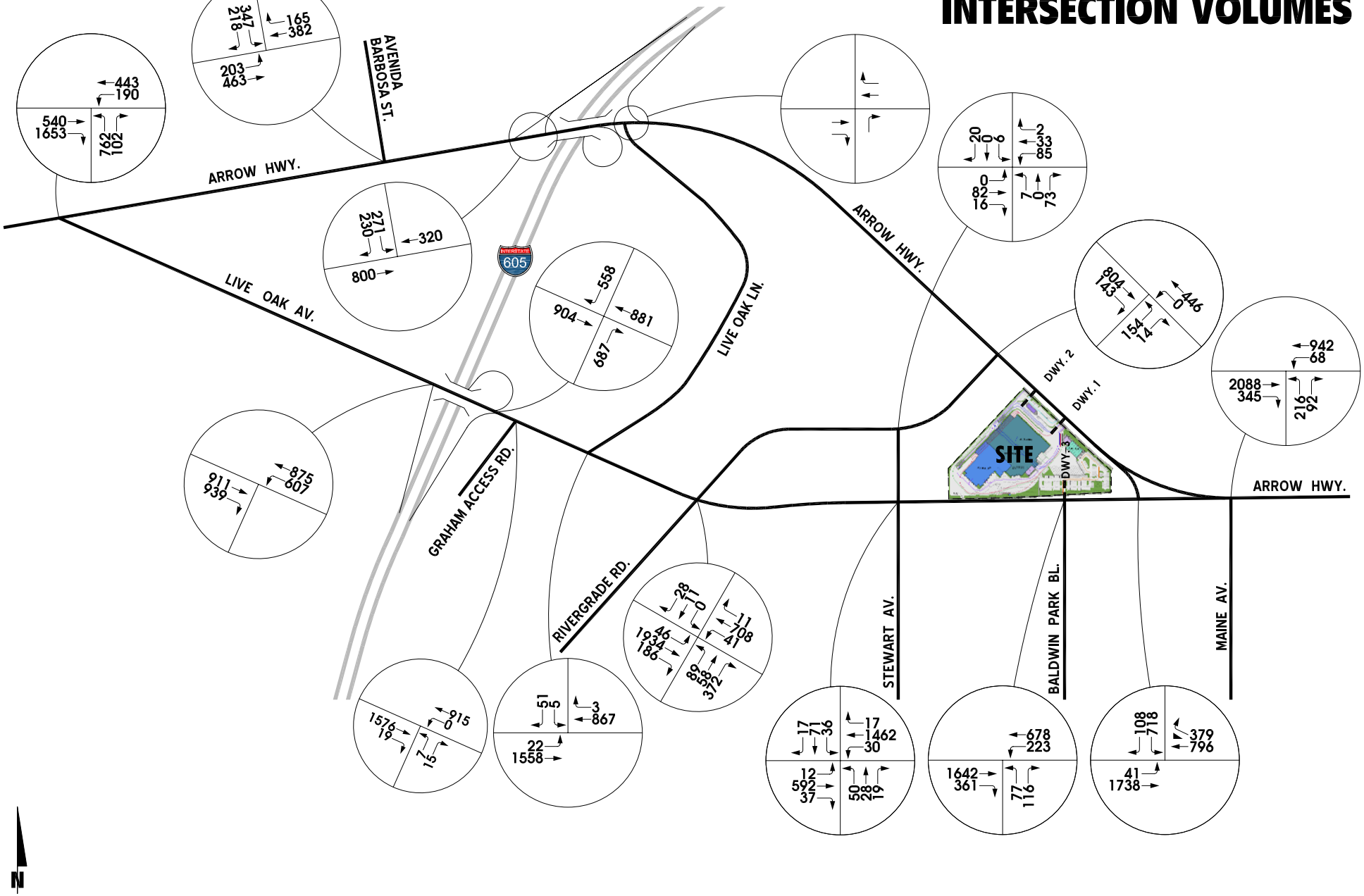


EXHIBIT 16

EXISTING PM PEAK HOUR INTERSECTION VOLUMES



A-21

TABLE 1
PROJECT TRIP GENERATION RATES

LAND USE	UNIT[1]	AM PEAK HOUR			PM PEAK HOUR			DAILY
		IN	OUT	TOTAL	IN	OUT	TOTAL	
Truck Trips - 2-axle[2]	Site TPD	0.002	0.003	0.005	0.002	0.002	0.004	0.041
Truck Trips - 3-axle[2]	Site TPD	0.008	0.009	0.017	0.013	0.010	0.024	0.275
Truck Trips - 4-axle[2]	Site TPD	0.004	0.004	0.008	0.002	0.002	0.004	0.093
Employees (Passenger Cars)[3]	EMP	0.274	0.102	0.376	0.149	0.189	0.338	2.000
Convenience Store (ITE LU 853)	TSF	20.46	20.46	40.92	25.46	25.46	50.92	845.60

[1] Site TPD = Tons Per Day for entire site - Appendix A shows empirical data calculations used to develop trip rates; EMP = Employees; TSF = Thousand Square Feet

[2] Daily and peak hour quantities have been obtained from empirical data for similar uses, applied to the site maximum processing of 6,000TPD.

[3] Daily quantities assume 2 trips / employee. AM and PM peak hour to daily relationships have been based on ITE Land Use Code "140 EMP" (Manufacturing)

TABLE 2
PROJECT BUILDOUT (2016) TRIP GENERATION SUMMARY

LAND USE	COMMODITY DIRECTION	QUANTITY	UNIT[1]	AM PEAK HOUR IN	AM PEAK HOUR OUT	AM PEAK HOUR TOTAL	PM PEAK HOUR IN	PM PEAK HOUR OUT	PM PEAK HOUR TOTAL	DAILY
Self-Haul Trucks (525 TPD)[2] - 2-axle	INBOUND	6,000	Site TPD	12	19	31	12	12	24	249
Packer Trucks (3,812 TPD)[2] - 3-axle	*INBOUND*	*6,000*	*Site TPD*	*33*	*37*	*70*	*54*	*43*	*97*	*1,137*
End Dump Trucks (250 TPD)[2] - 3-axle	*INBOUND*	*6,000*	*Site TPD*	*2*	*2*	*4*	*3*	*3*	*6*	*66*
Roll-Off Trucks (1,496 TPD)[2] - Collection & Transfer - 3-axle	*IN / OUT*	*6,000*	*Site TPD*	*13*	*14*	*27*	*21*	*17*	*38*	*445*
Total 3-axle	IN / OUT	6,000	Site TPD	48	53	101	78	63	141	1,648
Transfer Trucks incl. Recyclable Loadout (5,918 TPD)[2] - 4-axle	OUTBOUND	6,000	Site TPD	24	24	48	9	14	23	559
NET TRUCK TRIPS:				**84**	**96**	**180**	**99**	**89**	**188**	**2,456**
Self-Haul Trucks (PCE = Truck x 1.5)				*18*	*29*	*47*	*18*	*18*	*36*	*374*
Collection (Packer and End Dump) and all Roll-Off Trucks (PCE = Truck x 2.7)				*130*	*143*	*273*	*211*	*170*	*381*	*4,450*
Transfer Trucks (PCE = Truck x 3.7)				*89*	*89*	*178*	*33*	*52*	*85*	*2,068*
NET TRUCK TRIPS (PCE):				**237**	**261**	**498**	**262**	**240**	**502**	**6,892**
Employees (Total of 345 Employees daily)[3]				95	35	130	51	65	117	690
Transfer Station Subtotal (PCE)[5]				***332***	***296***	***628***	***313***	***305***	***619***	***7,582***
Convenience Market W/Pumps		2.4	TSF	49	49	98	61	61	122	2,029
- Pass by (63%)[4]				*-31*	*-31*	*-62*	*-38*	*-38*	*-77*	*-1,279*
Convenience Market W/Pumps Subtotal				***18***	***18***	***36***	***23***	***23***	***45***	***751***
TOTAL PROJECT TRIPS (PCE)[5]				**350**	**314**	**664**	**336**	**328**	**664**	**8,333**

[1] Site TPD = Tons Per Day for entire site - Appendix A shows empirical data calculations used to develop trip rates; EMP = Employees; TSF = Thousand Square Feet

[2] Daily and peak hour rates obtained from empirical data for similar uses, are applied to the site maximum processing of 6,000TPD. 3-axle trip gen by truck type is factored based on TPD for each type.

[3] Daily quantities assume 2 trips / employee. AM and PM peak hour to daily relationships have been based on ITE Land Use Code "140 EMP" (Manufacturing)

[4] Pass by % is based on Table 5-12 from the ITE Trip Generation Handbook 2nd Edition (2004)

[5] TOTAL TRIPS (PCE) = Net Truck Trips (PCE) + Employees + Convenience Market W/Pumps.

TABLE 3

INTERSECTION ANALYSIS LOCATIONS

INTERSECTION
1 - Live Oak Avenue (West) (NS) at Arrow Highway (EW)
2 - Avenida Barbosa Road (NS) at Arrow Highway (EW)
3 - I-605 Freeway SB Off Ramp (NS) at Arrow Highway (EW)
4 - Live Oak Lane / I-605 Freeway NB On Ramp (NS) at Arrow Highway (EW)
5 - Rivergrade Road (NS) at Arrow Highway (EW)
6 - Stewart Avenue (NS) at Rivergrade Road (EW)
7 - I-605 Freeway SB On Ramp (NS) at Live Oak Avenue (EW)
8 - I-605 Freeway NB Off Ramp (NS) at Live Oak Avenue (EW)
9 - Graham Access Road (NS) at Live Oak Avenue (EW)
10 - Live Oak Lane (Private Road) (NS) at Live Oak Avenue (EW)
11 - Rivergrade Road (NS) at Live Oak Avenue (EW)
12 - Stewart Avenue (NS) at Live Oak Avenue (EW)
13 - Baldwin Park Boulevard (NS) at Live Oak Avenue (EW)
14 - Arrow Highway (NS) at Live Oak Avenue (EW)
15 - Maine Avenue (NS) at Arrow Highway (EW)
16 - Driveway 1 (NS) at Arrow Highway (EW)
17 - Driveway 2 (NS) at Arrow Highway (EW)

ATTACHMENT 1

TRIP GENERATION EMPIRICAL DATA

TRIP GENERATION RATES FOR TRANSFER STATION LAND USE

2-AXLE TRUCKS

TRIP RATES	AM PEAK HOUR			PM PEAK HOUR			DAILY
	IN	OUT	TOTAL	IN	OUT	TOTAL	
Site 1	0.003	0.004	0.007	0.002	0.003	0.005	0.026
Site 2	0.002	0.003	0.005	0.002	0.002	0.004	0.017
Site 3	0.004	0.004	0.007	0.002	0.002	0.004	0.050
Site 4	0.001	0.002	0.003	0.002	0.001	0.003	0.054
STATISTICS BY TONS PER DAY							
Weighted Average Trips	0.002	0.003	0.005	0.002	0.002	0.004	0.041
Mean Trip Rate	0.003	0.003	0.005	0.002	0.002	0.004	0.037
Standard Deviation	0.001	0.001	0.002	0.000	0.001	0.001	0.016
Avg Pk % of Daily			12.6%			9.7%	

3-AXLE TRUCKS

TRIP RATES	AM PEAK HOUR			PM PEAK HOUR			DAILY
	IN	OUT	TOTAL	IN	OUT	TOTAL	
Site 1	0.018	0.015	0.033	0.015	0.016	0.031	0.307
Site 2	0.005	0.005	0.010	0.017	0.012	0.029	0.189
Site 3	0.009	0.008	0.017	0.003	0.002	0.005	0.126
Site 4	0.004	0.008	0.012	0.019	0.015	0.034	0.435
STATISTICS BY TONS PER DAY							
Weighted Average Trips	0.008	0.009	0.017	0.013	0.010	0.024	0.275
Mean Trip Rate	0.009	0.009	0.018	0.014	0.011	0.025	0.264
Standard Deviation	0.005	0.004	0.009	0.006	0.006	0.012	0.118
Avg Pk % of Daily			6.2%			8.6%	

4-AXLE TRUCKS

TRIP RATES	AM PEAK HOUR			PM PEAK HOUR			DAILY
	IN	OUT	TOTAL	IN	OUT	TOTAL	
Site 1	0.004	0.004	0.009	0.003	0.004	0.008	0.094
Site 2	0.005	0.005	0.009	0.001	0.004	0.005	0.076
Site 3	0.008	0.003	0.011	0.003	0.001	0.003	0.102
Site 4	0.000	0.004	0.004	0.000	0.002	0.002	0.093
STATISTICS BY TONS PER DAY							
Weighted Average Trips	0.004	0.004	0.008	0.002	0.002	0.004	0.093
Mean Trip Rate	0.004	0.004	0.008	0.002	0.003	0.004	0.091
Standard Deviation	0.003	0.000	0.003	0.001	0.002	0.002	0.010
Avg Pk % of Daily			8.6%			4.1%	

U:\UcJobs_08100-08500_08500\08517\Excel\[08517-03 TG Appendix.xls]TRIP GEN CALCS

DRIVEWAY COUNT DATA SUMMARY BY SITE

DAY OF	SITE 1				SITE 2				SITE 3				SITE 4			
THE WEEK	IN	OUT	TOTAL	DAILY	IN	OUT	TOTAL	DAILY	IN	OUT	TOTAL	DAILY	IN	OUT	TOTAL	DAILY
AM PEAK HOUR																
Tuesday	60	47	107		32	20	52		65	49	114		26	39	65	
Wednesday	40	38	78		27	27	54		148	33	181		33	51	84	
Thursday	38	38	76	788	27	24	51	529	77	67	144	1,141	18	63	81	1,115
AVERAGE	46	41	87		29	24	52		97	50	146		26	51	77	
TRIP RATE	0.031	0.027	0.058	0.525	0.019	0.016	0.035	0.353	0.036	0.018	0.054	0.423	0.009	0.017	0.026	0.372
PM PEAK HOUR																
Tuesday	34	41	75		41	42	83		49	31	80		58	55	113	
Wednesday	43	45	88		29	24	53		17	52	69		77	71	148	
Thursday	33	40	73		34	37	71		43	35	78		77	60	137	
AVERAGE	37	42	79		35	34	69		36	39	76		71	62	133	
TRIP RATE	0.024	0.028	0.052		0.023	0.023	0.046		0.013	0.015	0.028		0.024	0.021	0.044	

SUMMARY OF INDEPENDENT VARIABLES:

SITE 1:	1,500	tons/day
SITE 2:	1,500	tons/day
SITE 3:	2,700	tons/day
SITE 4:	3,000	tons/day
	8,700	tons/day

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	1	0	3	1	5	0	0	1	1	2
6:15-6:30	1	0	10	2	13	2	0	8	2	12
6:30-6:45	0	0	15	1	16	0	0	15	0	15
6:45-7:00	0	0	5	2	7	0	0	12	2	14
7:00-7:15	0	2	2	1	5	0	1	3	2	6
7:15-7:30	3	0	1	3	7	0	2	1	2	5
7:30-7:45	2	1	3	2	8	0	0	1	2	3
7:45-8:00	5	0	2	1	8	0	0	1	2	3
8:00-8:15	1	0	2	1	4	1	0	3	1	5
8:15-8:30	3	0	1	0	4	0	1	2	1	4
8:30-8:45	4	2	8	1	15	2	1	3	0	6
8:45-9:00	6	0	6	2	14	0	0	3	2	5
9:00-9:15	2	4	7	3	16	5	5	9	2	21
9:15-9:30	3	4	5	3	15	3	3	5	4	15
9:30-9:45	1	0	6	2	9	3	0	2	1	6
9:45-10:00	2	1	5	3	11	1	0	6	2	9
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	2	0	33	6	41	2	0	36	5	43
6:15-7:15	1	2	32	6	41	2	1	38	6	47
6:30-7:30	3	2	23	7	35	0	3	31	6	40
6:45-7:45	5	3	11	8	27	0	3	17	8	28
7:00-8:00	10	3	8	7	28	0	3	6	8	17
7:15-8:15	11	1	8	7	27	1	2	6	7	16
7:30-8:30	11	1	8	4	24	1	1	7	6	15
7:45-8:45	13	2	13	3	31	3	2	9	4	18
8:00-9:00	14	2	17	4	37	3	2	11	4	20
8:15-9:15	15	6	22	6	49	7	7	17	5	36
8:30-9:30	15	10	26	9	**60**	10	9	20	8	**47**
8:45-9:45	12	8	24	10	54	11	8	19	9	47
9:00-10:00	8	9	23	11	51	12	8	22	9	51

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	2	1	3	1	7	3	2	3	1	9
3:15-3:30	0	0	6	1	7	3	0	4	2	9
3:30-3:45	1	0	1	1	3	1	0	6	1	8
3:45-4:00	1	3	11	2	17	3	1	6	1	11
4:00-4:15	2	2	1	2	7	0	4	8	1	13
4:15-4:30	0	2	1	1	4	2	1	2	2	7
4:30-4:45	0	1	1	1	3	0	4	2	2	8
4:45-5:00	0	0	1	2	3	0	0	6	1	7
5:00-5:15	0	2	1	0	3	4	2	5	3	14
5:15-5:30	0	0	0	2	2	1	0	1	0	2
5:30-5:45	0	0	2	0	2	1	1	2	2	6
5:45-6:00	0	0	1	0	1	5	0	0	0	5
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	4	4	21	5	34	10	3	19	5	37
3:15-4:15	4	5	19	6	**34**	7	5	24	5	**41**
3:30-4:30	4	7	14	6	31	6	6	22	5	39
3:45-4:45	3	8	14	6	31	5	10	18	6	39
4:00-5:00	2	5	4	6	17	2	9	18	6	35
4:15-5:15	0	5	4	4	13	6	7	15	8	36
4:30-5:30	0	3	3	5	11	5	6	14	6	31
4:45-5:45	0	2	4	4	10	6	3	14	6	29
5:00-6:00	0	2	4	2	8	11	3	8	5	27

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	1	1	2	2	0	2	2	6
6:15-6:30	1	0	4	0	5	0	0	3	0	3
6:30-6:45	0	0	1	0	1	0	0	0	0	0
6:45-7:00	1	1	2	0	4	0	0	1	0	1
7:00-7:15	0	1	6	2	9	0	1	4	1	6
7:15-7:30	1	1	4	0	6	0	0	8	2	10
7:30-7:45	0	0	3	3	6	0	0	2	1	3
7:45-8:00	2	0	1	1	4	0	1	1	2	4
8:00-8:15	4	1	1	1	7	2	1	3	1	7
8:15-8:30	4	0	3	1	8	1	1	1	1	4
8:30-8:45	3	3	2	1	9	1	0	2	2	5
8:45-9:00	3	3	8	1	15	1	3	4	1	9
9:00-9:15	2	1	6	1	10	3	3	5	1	12
9:15-9:30	2	0	5	2	9	2	1	3	2	8
9:30-9:45	0	0	4	2	6	1	1	5	2	9
9:45-10:00	1	0	3	2	6	2	0	3	2	7
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	2	1	8	1	12	2	0	6	2	10
6:15-7:15	2	2	13	2	19	0	1	8	1	10
6:30-7:30	2	3	13	2	20	0	1	13	3	17
6:45-7:45	2	3	15	5	25	0	1	15	4	20
7:00-8:00	3	2	14	6	25	0	2	15	6	23
7:15-8:15	7	2	9	5	23	2	2	14	6	24
7:30-8:30	10	1	8	6	25	3	3	7	5	18
7:45-8:45	13	4	7	4	28	4	3	7	6	20
8:00-9:00	14	7	14	4	39	5	5	10	5	25
8:15-9:15	12	7	19	4	42	6	7	12	5	30
8:30-9:30	10	7	21	5	43	7	7	14	6	34
8:45-9:45	7	4	23	6	**40**	7	8	17	6	**38**
9:00-10:00	5	1	18	7	31	8	5	16	7	36

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	4	2	5	0	11	4	2	1	1	8
3:15-3:30	1	0	6	1	8	3	2	4	0	9
3:30-3:45	2	1	9	2	14	4	1	11	2	18
3:45-4:00	1	1	6	1	9	1	1	6	1	9
4:00-4:15	4	0	3	2	9	2	0	4	3	9
4:15-4:30	3	1	8	2	14	2	0	3	1	6
4:30-4:45	1	1	7	0	9	2	2	9	1	14
4:45-5:00	3	0	8	0	11	5	0	9	2	16
5:00-5:15	0	0	2	1	3	0	0	4	0	4
5:15-5:30	0	0	3	2	5	3	0	4	2	9
5:30-5:45	0	0	0	1	1	3	0	2	2	7
5:45-6:00	0	0	0	1	1	0	0	0	1	1
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	8	4	26	4	42	12	6	22	4	44
3:15-4:15	8	2	24	6	40	10	4	25	6	45
3:30-4:30	10	3	26	7	46	9	2	24	7	42
3:45-4:45	9	3	24	5	41	7	3	22	6	38
4:00-5:00	11	2	26	4	**43**	11	2	25	7	**45**
4:15-5:15	7	2	25	3	37	9	2	25	4	40
4:30-5:30	4	1	20	3	28	10	2	26	5	43
4:45-5:45	3	0	13	4	20	11	0	19	6	36
5:00-6:00	0	0	5	5	10	6	0	10	5	21

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	2	1	3	1	0	1	1	3
6:15-6:30	1	1	13	1	16	0	0	7	0	7
6:30-6:45	0	0	8	2	10	0	1	10	2	13
6:45-7:00	0	0	7	1	8	1	0	10	2	13
7:00-7:15	0	0	3	1	4	0	0	4	1	5
7:15-7:30	2	0	1	0	3	0	0	2	0	2
7:30-7:45	1	0	1	2	4	0	0	0	1	1
7:45-8:00	0	0	2	1	3	0	0	2	1	3
8:00-8:15	1	1	4	1	7	1	0	1	1	3
8:15-8:30	0	0	2	0	2	0	0	5	1	6
8:30-8:45	3	0	5	1	9	4	0	3	2	9
8:45-9:00	2	4	6	1	13	1	2	4	0	7
9:00-9:15	1	0	3	1	5	3	0	5	2	10
9:15-9:30	2	0	5	3	10	1	0	4	0	5
9:30-9:45	2	1	8	2	13	2	0	4	4	10
9:45-10:00	1	0	4	2	7	0	0	6	3	9
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	1	1	30	5	37	2	1	28	5	36
6:15-7:15	1	1	31	5	**38**	1	1	31	5	**38**
6:30-7:30	2	0	19	4	25	1	1	26	5	33
6:45-7:45	3	0	12	4	19	1	0	16	4	21
7:00-8:00	3	0	7	4	14	0	0	8	3	11
7:15-8:15	4	1	8	4	17	1	0	5	3	9
7:30-8:30	2	1	9	4	16	1	0	8	4	13
7:45-8:45	4	1	13	3	21	5	0	11	5	21
8:00-9:00	6	5	17	3	31	6	2	13	4	25
8:15-9:15	6	4	16	3	29	8	2	17	5	32
8:30-9:30	8	4	19	6	37	9	2	16	4	31
8:45-9:45	7	5	22	7	41	7	2	17	6	32
9:00-10:00	6	1	20	8	35	6	0	19	9	34

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	0	0	6	1	7	1	1	4	2	8
3:15-3:30	0	2	6	3	11	0	0	5	3	8
3:30-3:45	1	1	4	1	7	2	2	6	2	12
3:45-4:00	0	1	8	0	9	0	2	6	1	9
4:00-4:15	1	0	4	1	6	1	1	7	2	11
4:15-4:30	4	0	4	3	11	1	0	2	0	3
4:30-4:45	0	2	6	1	9	3	0	5	1	9
4:45-5:00	0	0	4	0	4	0	3	6	2	11
5:00-5:15	0	0	0	1	1	1	0	4	0	5
5:15-5:30	0	0	0	2	2	1	0	1	0	2
5:30-5:45	0	0	0	2	2	0	0	2	4	6
5:45-6:00	0	0	0	1	1	0	0	0	1	1
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	1	4	24	5	34	3	5	21	8	37
3:15-4:15	2	4	22	5	**33**	3	5	24	8	**40**
3:30-4:30	6	2	20	5	33	4	5	21	5	35
3:45-4:45	5	3	22	5	35	5	3	20	4	32
4:00-5:00	5	2	18	5	30	5	4	20	5	34
4:15-5:15	4	2	14	5	25	5	3	17	3	28
4:30-5:30	0	2	10	4	16	5	3	16	3	27
4:45-5:45	0	0	4	5	9	2	3	13	6	24
5:00-6:00	0	0	0	6	6	2	0	7	5	14

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (4:00 AM - 6:00 PM - Business Day)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
4:00-4:15	0	0	0	1	1	1	0	0	0	1
4:15-4:30	1	0	1	0	2	0	0	0	0	0
4:30-4:45	0	0	4	0	4	1	0	1	0	2
4:45-5:00	2	0	1	0	3	0	0	1	1	2
5:00-5:15	3	0	1	2	6	1	0	1	0	2
5:15-5:30	0	0	2	1	3	0	0	1	2	3
5:30-5:45	0	0	2	2	4	0	0	2	1	3
5:45-6:00	1	0	0	1	2	0	0	2	2	4
6:00-6:15	0	0	2	1	3	1	0	1	1	3
6:15-6:30	1	1	13	1	16	0	0	7	0	7
6:30-6:45	0	0	8	2	10	0	1	10	2	13
6:45-7:00	0	0	7	1	8	1	0	10	2	13
7:00-7:15	0	0	3	1	4	0	0	4	1	5
7:15-7:30	2	0	1	0	3	0	0	2	0	2
7:30-7:45	1	0	1	2	4	0	0	0	1	1
7:45-8:00	0	0	2	1	3	0	0	2	1	3
8:00-8:15	1	1	4	1	7	1	0	1	1	3
8:15-8:30	0	0	2	0	2	0	0	5	1	6
8:30-8:45	3	0	5	1	9	4	0	3	2	9
8:45-9:00	6	0	6	1	13	1	2	4	0	7
9:00-9:15	1	0	3	1	5	3	0	5	2	10
9:15-9:30	2	0	5	3	10	1	0	4	0	5
9:30-9:45	2	1	8	2	13	2	0	4	4	10
9:45-10:00	1	0	4	2	7	0	0	6	3	9
10:00-10:15	2	1	8	3	14	3	2	6	2	13
10:15-10:30	4	1	5	1	11	2	1	8	1	12
10:30-10:45	2	0	4	2	8	4	0	7	2	13
10:45-11:00	2	1	7	2	12	1	0	4	1	6
11:00-11:15	1	1	6	0	8	3	2	4	1	10
11:15-11:30	1	0	7	1	9	0	0	9	1	10
11:30-11:45	3	0	3	1	7	2	0	5	0	7
11:45-12:00	3	0	3	1	7	5	0	3	2	10
12:00-12:15	3	0	9	0	12	6	0	2	1	9
12:15-12:30	2	0	4	0	6	0	0	6	0	6
12:30-12:45	2	0	1	0	3	5	0	7	0	12
12:45-1:00	4	0	4	1	9	1	0	5	0	6
1:00-1:15	0	1	6	1	8	1	0	2	1	4
1:15-1:30	3	1	4	3	11	2	1	5	1	9
1:30-1:45	2	2	2	1	7	6	0	8	2	16
1:45-2:00	0	0	4	2	6	2	1	3	4	10
2:00-2:15	1	0	8	1	10	1	1	5	1	8
2:15-2:30	0	0	6	2	8	1	0	6	1	8
2:30-2:45	0	2	4	3	9	2	0	9	3	14
2:45-3:00	4	0	6	1	11	1	0	5	1	7
3:00-3:15	0	0	6	2	8	1	1	4	2	8
3:15-3:30	0	2	6	3	11	0	0	5	3	8
3:30-3:45	1	1	4	2	8	2	2	6	2	12
3:45-4:00	0	1	8	0	9	0	2	6	1	9
4:00-4:15	1	0	4	1	6	1	1	7	2	11
4:15-4:30	4	0	4	3	11	1	0	2	0	3
4:30-4:45	0	2	6	1	9	3	0	5	1	9
4:45-5:00	0	0	4	0	4	0	3	6	2	11
5:00-5:15	0	0	0	1	1	1	0	4	0	5
5:15-5:30	0	0	0	2	2	1	0	1	0	2
5:30-5:45	0	0	0	2	2	0	0	2	4	6
5:45-6:00	0	0	0	1	1	0	0	0	1	1
TOTALS	72	19	228	71	390	75	20	233	70	398

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (4:00 AM - 6:00 PM - Business Day)
SITE: SITE 1: American Waste Transfer Station (Gardena, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (4:00 AM - 5:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
4:00-5:00	3	0	6	1	10	2	0	2	1	5
4:15-5:15	6	0	7	2	15	2	0	3	1	6
4:30-5:30	5	0	8	3	16	2	0	4	3	9
4:45-5:45	5	0	6	5	16	1	0	5	4	10
5:00-6:00	4	0	5	6	15	1	0	6	5	12
5:15-6:15	1	0	6	5	12	1	0	6	6	13
5:30-6:30	2	1	17	5	25	1	0	12	4	17
5:45-6:45	2	1	23	5	31	1	1	20	5	27
6:00-7:00	1	1	30	5	37	2	1	28	5	36
6:15-7:15	1	1	31	5	38	1	1	31	5	38
6:30-7:30	2	0	19	4	25	1	1	26	5	33
6:45-7:45	3	0	12	4	19	1	0	16	4	21
7:00-8:00	3	0	7	4	14	0	0	8	3	11
7:15-8:15	4	1	8	4	17	1	0	5	3	9
7:30-8:30	2	1	9	4	16	1	0	8	4	13
7:45-8:45	4	1	13	3	21	5	0	11	5	21
8:00-9:00	**10**	**1**	**17**	**3**	**31**	**6**	**2**	**13**	**4**	**25**
8:15-9:15	10	0	16	3	29	8	2	17	5	32
8:30-9:30	12	0	19	6	37	9	2	16	4	31
8:45-9:45	11	1	22	7	41	7	2	17	6	32
9:00-10:00	6	1	20	8	35	6	0	19	9	34
9:15-10:15	7	2	25	10	44	6	2	20	9	37
9:30-10:30	**9**	**3**	**25**	**8**	**45**	**7**	**3**	**24**	**10**	**44**
9:45-10:45	9	2	21	8	40	9	3	27	8	47
10:00-11:00	**10**	**3**	**24**	**8**	**45**	**10**	**3**	**25**	**6**	**44**
10:15-11:15	9	3	22	5	39	10	3	23	5	41
10:30-11:30	6	2	24	5	37	8	2	24	5	39
10:45-11:45	7	2	23	4	36	6	2	22	3	33
11:00-12:00	8	1	19	3	31	10	2	21	4	37
11:15-12:15	10	0	22	3	35	13	0	19	4	36
11:30-12:30	11	0	19	2	32	13	0	16	3	32
11:45-12:45	10	0	17	1	28	16	0	18	3	37
12:00-1:00	11	0	18	1	30	12	0	20	1	33
12:15-1:15	8	1	15	2	26	7	0	20	1	28
12:30-1:30	9	2	15	5	31	9	1	19	2	31
12:45-1:45	9	4	16	6	35	10	1	20	4	35
1:00-2:00	5	4	16	7	32	11	2	18	8	39
1:15-2:15	6	3	18	7	34	11	3	21	8	43
1:30-2:30	3	2	20	6	31	10	2	22	8	42
1:45-2:45	1	2	22	8	33	6	2	23	9	40
2:00-3:00	5	2	24	7	38	5	1	25	6	37
2:15-3:15	4	2	22	8	36	5	1	24	7	37
2:30-3:30	4	4	22	9	39	4	1	23	9	37
2:45-3:45	5	3	22	8	38	4	3	20	8	35
3:00-4:00	1	4	24	7	36	3	5	21	8	37
3:15-4:15	2	4	22	6	34	3	5	24	8	40
3:30-4:30	6	2	20	6	34	4	5	21	5	35
3:45-4:45	5	3	22	5	35	5	3	20	4	32
4:00-5:00	**5**	**2**	**18**	**5**	**30**	**5**	**4**	**20**	**5**	**34**
4:15-5:15	4	2	14	5	25	5	3	17	3	28
4:30-5:30	0	2	10	4	16	5	3	16	3	27
4:45-5:45	0	0	4	5	9	2	3	13	6	24
5:00-6:00	0	0	0	6	6	2	0	7	5	14

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	3	3	0	0	0	1	1
6:15-6:30	0	0	0	1	1	0	0	0	1	1
6:30-6:45	0	0	0	2	2	0	0	0	1	1
6:45-7:00	0	0	0	3	3	0	1	0	3	4
7:00-7:15	1	2	0	2	5	0	0	0	3	3
7:15-7:30	2	0	1	1	4	0	1	0	2	3
7:30-7:45	3	0	2	0	5	0	2	1	1	4
7:45-8:00	1	1	3	0	5	2	0	3	1	6
8:00-8:15	2	0	0	3	5	0	0	2	0	2
8:15-8:30	3	1	2	2	8	0	0	0	4	4
8:30-8:45	0	1	1	1	3	1	0	1	3	5
8:45-9:00	2	3	0	0	5	0	2	2	1	5
DWY 1	0	0	4	0		0	0	0	0	
DWY 2	0	0	0	0		0	1	1	0	
DWY 3	4	0	0	0		0	0	0	0	
9:00-9:15	4	0	4	0	8	0	1	1	0	2
9:15-9:30	2	1	3	1	7	1	2	3	0	6
9:30-9:45	4	2	0	3	9	2	1	2	2	7
9:45-10:00	2	3	2	1	8	0	4	1	0	5
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	0	0	0	9	9	0	1	0	6	7
6:15-7:15	1	2	0	8	11	0	1	0	8	9
6:30-7:30	3	2	1	8	14	0	2	0	9	11
6:45-7:45	6	2	3	6	17	0	4	1	9	14
7:00-8:00	7	3	6	3	19	2	3	4	7	16
7:15-8:15	8	1	6	4	19	2	3	6	4	15
7:30-8:30	9	2	7	5	23	2	2	6	6	16
7:45-8:45	6	3	6	6	21	3	0	6	8	17
8:00-9:00	7	5	3	6	21	1	2	5	8	16
8:15-9:15	9	5	7	3	24	1	3	4	8	16
8:30-9:30	8	5	8	2	23	2	5	7	4	18
8:45-9:45	12	6	7	4	29	3	6	8	3	20
9:00-10:00	12	6	9	5	**32**	3	8	7	2	**20**

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	1	1	5	2	9	2	1	0	0	3
3:15-3:30	0	1	5	0	6	1	0	6	0	7
3:30-3:45	1	0	5	0	6	1	0	1	4	6
3:45-4:00	4	4	11	0	19	3	2	5	2	12
4:00-4:15	1	1	8	0	10	5	1	5	1	12
4:15-4:30	0	0	6	0	6	1	1	7	3	12
4:30-4:45	2	0	2	0	4	2	0	3	3	8
4:45-5:00	0	1	4	0	5	3	1	1	2	7
5:00-5:15	0	0	2	0	2	1	1	0	5	7
5:15-5:30	1	0	3	0	4	0	0	1	2	3
5:30-5:45	7	0	0	0	7	9	0	0	2	11
5:45-6:00	1	0	0	0	1	2	0	0	0	2
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	6	6	26	2	40	7	3	12	6	28
3:15-4:15	6	6	29	0	41	10	3	17	7	37
3:30-4:30	6	5	30	0	**41**	10	4	18	10	**42**
3:45-4:45	7	5	27	0	39	11	4	20	9	44
4:00-5:00	3	2	20	0	25	11	3	16	9	39
4:15-5:15	2	1	14	0	17	7	3	11	13	34
4:30-5:30	3	1	11	0	15	6	2	5	12	25
4:45-5:45	8	1	9	0	18	13	2	2	11	28
5:00-6:00	9	0	5	0	14	12	1	1	9	23

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	3	3	0	0	0	4	4
6:15-6:30	0	0	0	1	1	0	0	0	1	1
6:30-6:45	0	0	1	3	4	0	0	0	2	2
6:45-7:00	0	1	1	4	6	0	0	1	4	5
7:00-7:15	0	3	1	0	4	0	2	1	1	4
7:15-7:30	0	0	2	1	3	0	1	0	2	3
7:30-7:45	1	3	2	0	6	0	0	3	0	3
7:45-8:00	2	2	3	2	9	1	0	0	0	1
8:00-8:15	4	1	0	4	9	1	2	5	3	11
8:15-8:30	4	0	1	2	7	0	1	0	2	3
8:30-8:45	1	0	1	0	2	0	0	2	2	4
8:45-9:00	3	1	4	1	9	0	0	0	0	0
9:00-9:15	2	1	2	2	7	0	2	3	4	9
9:15-9:30	2	1	1	2	6	1	1	4	1	7
9:30-9:45	3	0	1	4	8	2	0	2	4	8
9:45-10:00	3	1	0	2	6	1	0	1	1	3
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	0	1	2	11	14	0	0	1	11	12
6:15-7:15	0	4	3	8	15	0	2	2	8	12
6:30-7:30	0	4	5	8	17	0	3	2	9	14
6:45-7:45	1	7	6	5	19	0	3	5	7	15
7:00-8:00	3	8	8	3	22	1	3	4	3	11
7:15-8:15	7	6	7	7	27	2	3	8	5	18
7:30-8:30	11	6	6	8	31	2	3	8	5	18
7:45-8:45	11	3	5	8	27	2	3	7	7	19
8:00-9:00	12	2	6	7	27	1	3	7	7	18
8:15-9:15	10	2	8	5	25	0	3	5	8	16
8:30-9:30	8	3	8	5	24	1	3	9	7	20
8:45-9:45	10	3	8	9	30	3	3	9	9	24
9:00-10:00	10	3	4	10	**27**	4	3	10	10	**27**

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	2	0	7	0	9	1	1	1	1	4
3:15-3:30	1	1	2	2	6	0	1	0	3	4
3:30-3:45	3	1	6	0	10	2	0	3	1	6
3:45-4:00	1	0	6	0	7	2	1	3	0	6
4:00-4:15	2	1	3	0	6	4	0	1	3	8
4:15-4:30	1	0	1	0	2	2	0	0	1	3
4:30-4:45	0	0	3	0	3	0	0	0	3	3
4:45-5:00	1	3	3	0	7	2	0	0	1	3
5:00-5:15	1	0	2	0	3	1	2	1	1	5
5:15-5:30	0	0	3	0	3	0	0	1	3	4
5:30-5:45	2	1	8	0	11	7	0	2	4	13
5:45-6:00	0	1	4	0	5	0	0	3	1	4
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	7	2	21	2	32	5	3	7	5	20
3:15-4:15	7	3	17	2	**29**	8	2	7	7	**24**
3:30-4:30	7	2	16	0	25	10	1	7	5	23
3:45-4:45	4	1	13	0	18	8	1	4	7	20
4:00-5:00	4	4	10	0	18	8	0	1	8	17
4:15-5:15	3	3	9	0	15	5	2	1	6	14
4:30-5:30	2	3	11	0	16	3	2	2	8	15
4:45-5:45	4	4	16	0	24	10	2	4	9	25
5:00-6:00	3	2	17	0	22	8	2	7	9	26

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	2	2	0	0	0	1	1
6:15-6:30	0	1	0	0	1	0	0	0	2	2
6:30-6:45	0	1	0	3	4	0	0	0	1	1
6:45-7:00	1	1	2	4	8	0	0	2	3	5
7:00-7:15	0	0	0	1	1	0	1	1	1	3
7:15-7:30	0	0	3	2	5	0	1	2	2	5
7:30-7:45	1	2	0	0	3	0	0	2	0	2
7:45-8:00	1	0	2	1	4	0	1	1	1	3
8:00-8:15	0	1	1	2	4	1	1	1	0	3
8:15-8:30	4	0	1	2	7	0	1	2	2	5
8:30-8:45	2	0	2	2	6	2	0	1	3	6
8:45-9:00	3	0	3	0	6	1	0	1	2	4
9:00-9:15	3	1	1	1	6	1	0	2	2	5
9:15-9:30	2	0	4	3	9	4	1	2	2	9
9:30-9:45	0	0	2	0	2	0	0	4	0	4
9:45-10:00	2	0	4	1	7	0	0	4	1	5
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	1	3	2	9	15	0	0	2	7	9
6:15-7:15	1	3	2	8	14	0	1	3	7	11
6:30-7:30	1	2	5	10	18	0	2	5	7	14
6:45-7:45	2	3	5	7	17	0	2	7	6	15
7:00-8:00	2	2	5	4	13	0	3	6	4	13
7:15-8:15	2	3	6	5	16	1	3	6	3	13
7:30-8:30	6	3	4	5	18	1	3	6	3	13
7:45-8:45	7	1	6	7	21	3	3	5	6	17
8:00-9:00	9	1	7	6	23	4	2	5	7	18
8:15-9:15	12	1	7	5	25	4	1	6	9	20
8:30-9:30	10	1	10	6	**27**	8	1	6	9	**24**
8:45-9:45	8	1	10	4	23	6	1	9	6	22
9:00-10:00	7	1	11	5	24	5	1	12	5	23

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	0	1	9	0	10	2	1	8	0	11
3:15-3:30	1	0	12	0	13	0	3	4	0	7
3:30-3:45	0	0	7	0	7	0	0	9	0	9
3:45-4:00	1	0	2	1	4	2	0	7	1	10
4:00-4:15	1	0	0	0	1	2	0	4	1	7
4:15-4:30	0	0	3	0	3	2	0	4	1	7
4:30-4:45	0	0	5	0	5	4	0	0	0	4
4:45-5:00	1	0	2	0	3	5	0	2	2	9
5:00-5:15	0	0	0	0	0	2	0	2	1	5
5:15-5:30	0	0	7	0	7	1	0	4	0	5
5:30-5:45	0	1	2	0	3	1	0	5	0	6
5:45-6:00	0	0	0	0	0	1	1	2	0	4
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	2	1	30	1	**34**	4	4	28	1	**37**
3:15-4:15	3	0	21	1	25	4	3	24	2	33
3:30-4:30	2	0	12	1	15	6	0	24	3	33
3:45-4:45	2	0	10	1	13	10	0	15	3	28
4:00-5:00	2	0	10	0	12	13	0	10	4	27
4:15-5:15	1	0	10	0	11	13	0	8	4	25
4:30-5:30	1	0	14	0	15	12	0	8	3	23
4:45-5:45	1	1	11	0	13	9	0	13	3	25
5:00-6:00	0	1	9	0	10	5	1	13	1	20

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM - 6:30 PM - Business Day)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	2	2	0	0	0	1	1
6:15-6:30	0	1	0	0	1	0	0	0	2	2
6:30-6:45	0	1	0	3	4	0	0	0	1	1
6:45-7:00	1	1	2	4	8	0	0	2	3	5
7:00-7:15	0	0	0	1	1	0	1	1	1	3
7:15-7:30	0	0	3	2	5	0	1	2	2	5
7:30-7:45	1	2	0	0	3	0	0	2	0	2
7:45-8:00	1	0	2	1	4	0	1	1	1	3
8:00-8:15	0	1	1	2	4	1	1	1	0	3
8:15-8:30	4	0	1	2	7	0	1	2	2	5
8:30-8:45	2	0	2	2	6	2	0	1	3	6
8:45-9:00	3	0	3	0	6	1	0	1	2	4
9:00-9:15	3	1	1	1	6	1	0	2	2	5
9:15-9:30	2	0	4	3	9	4	1	2	2	9
9:30-9:45	0	0	2	0	2	0	0	4	0	4
9:45-10:00	2	0	4	1	7	0	0	4	1	5
10:00-10:15	1	0	3	1	5	0	0	4	1	5
10:15-10:30	1	0	2	1	4	2	0	0	1	3
10:30-10:45	1	0	6	2	9	1	0	0	1	2
10:45-11:00	1	0	5	1	7	0	1	10	2	13
11:00-11:15	1	2	5	2	10	1	0	6	2	9
11:15-11:30	2	0	2	2	6	2	0	5	1	8
11:30-11:45	4	0	5	1	10	1	0	2	3	6
11:45-12:00	2	0	4	2	8	0	0	3	3	6
12:00-12:15	0	0	2	2	4	3	0	4	3	10
12:15-12:30	2	0	1	2	5	0	0	5	1	6
12:30-12:45	0	0	2	2	4	0	0	0	1	1
12:45-1:00	2	0	5	0	7	2	0	3	1	6
1:00-1:15	1	0	0	3	4	0	0	4	1	5
1:15-1:30	2	0	3	1	6	1	0	1	0	2
1:30-1:45	1	0	1	3	5	2	1	3	1	7
1:45-2:00	4	1	5	1	11	2	0	2	0	4
2:00-2:15	1	0	3	2	6	3	0	3	1	7
2:15-2:30	1	0	2	1	4	0	0	5	2	7
2:30-2:45	0	0	8	1	9	1	0	3	2	6
2:45-3:00	2	0	4	2	8	0	0	3	1	4
3:00-3:15	0	1	9	0	10	2	1	8	0	11
3:15-3:30	1	0	12	0	13	0	3	4	0	7
3:30-3:45	0	0	7	0	7	0	0	9	0	9
3:45-4:00	1	0	2	1	4	2	0	7	1	10
4:00-4:15	1	0	0	0	1	2	0	4	1	7
4:15-4:30	0	0	3	0	3	2	0	4	1	7
4:30-4:45	0	0	5	0	5	4	0	0	0	4
4:45-5:00	1	0	2	0	3	5	0	2	2	9
5:00-5:15	0	0	0	0	0	2	0	2	1	5
5:15-5:30	0	0	7	0	7	1	0	4	0	5
5:30-5:45	0	1	2	0	3	1	0	5	0	6
5:45-6:00	0	0	0	0	0	1	1	2	0	4
6:00-6:15	0	0	0	0	0	0	0	0	0	0
6:15-6:30	0	0	0	0	0	1	0	0	1	2
TOTALS	52	12	142	57	263	53	13	142	58	266

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM - 6:30 PM - Business Day)
SITE: SITE 2: Waste Management of Orange (Orange, CA)
OPERATION: Approximately 1,500 tons per day
HOURS: Monday-Friday (5:30 AM - 6:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	1	3	2	9	15	0	0	2	7	9
6:15-7:15	1	3	2	8	14	0	1	3	7	11
6:30-7:30	1	2	5	10	18	0	2	5	7	14
6:45-7:45	2	3	5	7	17	0	2	7	6	15
7:00-8:00	2	2	5	4	13	0	3	6	4	13
7:15-8:15	2	3	6	5	16	1	3	6	3	13
7:30-8:30	6	3	4	5	18	1	3	6	3	13
7:45-8:45	7	1	6	7	21	3	3	5	6	17
8:00-9:00	**9**	**1**	**7**	**6**	**23**	**4**	**2**	**5**	**7**	**18**
8:15-9:15	12	1	7	5	25	4	1	6	9	20
8:30-9:30	10	1	10	6	27	8	1	6	9	24
8:45-9:45	8	1	10	4	23	6	1	9	6	22
9:00-10:00	7	1	11	5	24	5	1	12	5	23
9:15-10:15	5	0	13	5	23	4	1	14	4	23
9:30-10:30	4	0	11	3	18	2	0	12	3	17
9:45-10:45	5	0	15	5	25	3	0	8	4	15
10:00-11:00	4	0	16	5	25	3	1	14	5	23
10:15-11:15	4	2	18	6	30	4	1	16	6	27
10:30-11:30	5	2	18	7	32	4	1	21	6	32
10:45-11:45	8	2	17	6	33	4	1	23	8	36
11:00-12:00	9	2	16	7	34	4	0	16	9	29
11:15-12:15	8	0	13	7	28	6	0	14	10	30
11:30-12:30	8	0	12	7	27	4	0	14	10	28
11:45-12:45	4	0	9	8	21	3	0	12	8	23
12:00-1:00	4	0	10	6	20	5	0	12	6	23
12:15-1:15	5	0	8	7	20	2	0	12	4	18
12:30-1:30	5	0	10	6	21	3	0	8	3	14
12:45-1:45	6	0	9	7	22	5	1	11	3	20
1:00-2:00	8	1	9	8	26	5	1	10	2	18
1:15-2:15	8	1	12	7	28	8	1	9	2	20
1:30-2:30	7	1	11	7	26	7	1	13	4	25
1:45-2:45	6	1	18	5	30	6	0	13	5	24
2:00-3:00	4	0	17	6	27	4	0	14	6	24
2:15-3:15	3	1	23	4	31	3	1	19	5	28
2:30-3:30	3	1	33	3	40	3	4	18	3	28
2:45-3:45	3	1	32	2	38	2	4	24	1	31
3:00-4:00	**2**	**1**	**30**	**1**	**34**	**4**	**4**	**28**	**1**	**37**
3:15-4:15	3	0	21	1	25	4	3	24	2	33
3:30-4:30	2	0	12	1	15	6	0	24	3	33
3:45-4:45	2	0	10	1	13	10	0	15	3	28
4:00-5:00	**2**	**0**	**10**	**0**	**12**	**13**	**0**	**10**	**4**	**27**
4:15-5:15	1	0	10	0	11	13	0	8	4	25
4:30-5:30	1	0	14	0	15	12	0	8	3	23
4:45-5:45	1	1	11	0	13	9	0	13	3	25
5:00-6:00	0	1	9	0	10	5	1	13	1	20
6:00-6:15	0	1	9	0	10	3	1	11	0	15
6:15-6:30	0	1	2	0	3	3	1	7	1	12

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	1	0	1	2	3	0	21	3	27
6:15-6:30	2	0	0	0	2	0	1	12	2	15
6:30-6:45	0	0	5	5	10	0	0	3	2	5
6:45-7:00	2	1	7	2	12	0	3	9	4	16
7:00-7:15	1	0	2	2	5	1	2	5	4	12
7:15-7:30	3	0	1	0	4	0	0	0	3	3
7:30-7:45	4	2	3	2	11	3	1	1	1	6
7:45-8:00	6	2	11	3	22	2	2	4	1	9
8:00-8:15	5	3	5	2	15	1	6	6	1	14
8:15-8:30	7	2	5	1	15	5	2	9	1	17
8:30-8:45	2	2	6	3	13	2	1	3	3	9
8:45-9:00	2	1	7	5	15	3	2	3	0	8
9:00-9:15	2	1	5	5	13	3	0	5	2	10
9:15-9:30	3	1	11	1	16	1	1	5	0	7
9:30-9:45	2	3	7	2	14	2	4	2	3	11
9:45-10:00	2	0	5	4	11	1	1	9	3	14
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	4	2	12	8	26	3	4	45	11	63
6:15-7:15	5	1	14	9	29	1	6	29	12	48
6:30-7:30	6	1	15	9	31	1	5	17	13	36
6:45-7:45	10	3	13	6	32	4	6	15	12	37
7:00-8:00	14	4	17	7	42	6	5	10	9	30
7:15-8:15	18	7	20	7	52	6	9	11	6	32
7:30-8:30	22	9	24	8	63	11	11	20	4	46
7:45-8:45	20	9	27	9	**65**	10	11	22	6	**49**
8:00-9:00	16	8	23	11	58	11	11	21	5	48
8:15-9:15	13	6	23	14	56	13	5	20	6	44
8:30-9:30	9	5	29	14	57	9	4	16	5	34
8:45-9:45	9	6	30	13	58	9	7	15	5	36
9:00-10:00	9	5	28	12	54	7	6	21	8	42

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	2	0	0	2	4	6	0	1	0	7
3:15-3:30	5	4	5	1	15	3	0	1	0	4
3:30-3:45	4	3	5	5	17	6	1	1	1	9
3:45-4:00	7	0	1	2	10	5	0	1	1	7
4:00-4:15	3	1	3	0	7	9	1	1	0	11
4:15-4:30	4	0	0	1	5	5	0	0	0	5
4:30-4:45	1	2	0	0	3	4	2	0	0	6
4:45-5:00	1	0	1	0	2	3	0	1	0	4
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	18	7	11	10	46	20	1	4	2	27
3:15-4:15	19	8	14	8	**49**	23	2	4	2	**31**
3:30-4:30	18	4	9	8	39	25	2	3	2	32
3:45-4:45	15	3	4	3	25	23	3	2	1	29
4:00-5:00	9	3	4	1	17	21	3	2	0	26

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	1	1	0	1	3	1	5
6:15-6:30	5	1	1	4	11	1	0	6	0	7
6:30-6:45	7	0	6	4	17	1	0	2	0	3
6:45-7:00	6	2	5	3	16	1	0	6	0	7
7:00-7:15	10	3	5	1	19	0	2	5	0	7
7:15-7:30	8	3	1	0	12	1	1	4	0	6
7:30-7:45	6	3	5	0	14	0	4	1	0	5
7:45-8:00	20	0	7	7	34	0	4	5	2	11
8:00-8:15	9	0	3	5	17	1	5	5	2	13
8:15-8:30	15	4	10	4	33	2	5	3	0	10
8:30-8:45	13	5	5	3	26	1	1	5	1	8
8:45-9:00	19	3	8	4	34	0	3	4	0	7
9:00-9:15	25	3	6	2	36	0	5	5	1	11
9:15-9:30	30	4	6	8	48	0	0	8	1	9
9:30-9:45	19	3	5	3	30	0	1	4	1	6
9:45-10:00	17	1	3	5	26	0	2	2	3	7
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	18	3	12	12	45	3	1	17	1	22
6:15-7:15	28	6	17	12	63	3	2	19	0	24
6:30-7:30	31	8	17	8	64	3	3	17	0	23
6:45-7:45	30	11	16	4	61	2	7	16	0	25
7:00-8:00	44	9	18	8	79	1	11	15	2	29
7:15-8:15	43	6	16	12	77	2	14	15	4	35
7:30-8:30	50	7	25	16	98	3	18	14	4	39
7:45-8:45	57	9	25	19	110	4	15	18	5	42
8:00-9:00	56	12	26	16	110	4	14	17	3	38
8:15-9:15	72	15	29	13	129	3	14	17	2	36
8:30-9:30	87	15	25	17	144	1	9	22	3	35
8:45-9:45	93	13	25	17	**148**	0	9	21	3	**33**
9:00-10:00	91	11	20	18	140	0	8	19	6	33

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	2	1	1	2	6	12	1	2	1	16
3:15-3:30	2	2	1	0	5	11	1	2	1	15
3:30-3:45	1	1	1	1	4	16	0	1	0	17
3:45-4:00	0	1	1	0	2	3	1	0	0	4
4:00-4:15	0	1	0	3	4	7	0	2	0	9
4:15-4:30	2	2	1	0	5	3	0	3	0	6
4:30-4:45	1	1	0	0	2	5	0	0	0	5
4:45-5:00	2	0	0	0	2	3	0	0	0	3
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	5	5	4	3	**17**	42	3	5	2	**52**
3:15-4:15	3	5	3	4	15	37	2	5	1	45
3:30-4:30	3	5	3	4	15	29	1	6	0	36
3:45-4:45	3	5	2	3	13	18	1	5	0	24
4:00-5:00	5	4	1	3	13	18	0	5	0	23

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	2	2	1	4	16	5	26
6:15-6:30	5	2	0	3	10	0	0	8	4	12
6:30-6:45	1	0	2	4	7	0	1	5	3	9
6:45-7:00	5	0	6	2	13	0	1	1	6	8
7:00-7:15	3	0	1	1	5	1	1	5	3	10
7:15-7:30	3	0	3	0	6	0	0	2	2	4
7:30-7:45	6	4	5	1	16	1	2	1	0	4
7:45-8:00	10	3	2	4	19	4	1	0	1	6
8:00-8:15	8	0	7	6	21	4	1	3	3	11
8:15-8:30	9	1	4	5	19	3	1	7	0	11
8:30-8:45	6	1	9	5	21	5	1	5	1	12
8:45-9:00	2	2	5	6	15	1	2	0	1	4
9:00-9:15	3	1	4	3	11	5	0	2	2	9
9:15-9:30	2	2	5	6	15	10	2	5	4	21
9:30-9:45	5	1	8	16	30	2	3	7	6	18
9:45-10:00	1	3	6	11	21	4	4	5	6	19
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	11	2	8	11	32	1	6	30	18	55
6:15-7:15	14	2	9	10	35	1	3	19	16	39
6:30-7:30	12	0	12	7	31	1	3	13	14	31
6:45-7:45	17	4	15	4	40	2	4	9	11	26
7:00-8:00	22	7	11	6	46	6	4	8	6	24
7:15-8:15	27	7	17	11	62	9	4	6	6	25
7:30-8:30	33	8	18	16	75	12	5	11	4	32
7:45-8:45	33	5	22	20	80	16	4	15	5	40
8:00-9:00	25	4	25	22	76	13	5	15	5	38
8:15-9:15	20	5	22	19	66	14	4	14	4	36
8:30-9:30	13	6	23	20	62	21	5	12	8	46
8:45-9:45	12	6	22	31	71	18	7	14	13	52
9:00-10:00	11	7	23	36	**77**	21	9	19	18	**67**

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	1	1	4	0	6	3	0	0	0	3
3:15-3:30	2	1	4	4	11	3	2	0	0	5
3:30-3:45	2	4	2	3	11	3	2	3	1	9
3:45-4:00	7	1	2	2	12	6	3	1	0	10
4:00-4:15	5	1	1	2	9	8	2	0	1	11
4:15-4:30	3	0	2	1	6	3	0	2	1	6
4:30-4:45	0	0	0	0	0	11	0	0	0	11
4:45-5:00	2	0	2	0	4	5	0	0	0	5
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	12	7	12	9	40	15	7	4	1	27
3:15-4:15	16	7	9	11	**43**	20	9	4	2	**35**
3:30-4:30	17	6	7	8	38	20	7	6	3	36
3:45-4:45	15	2	5	5	27	28	5	3	2	38
4:00-5:00	10	1	5	3	19	27	2	2	2	33

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM - 5:00 PM - Business Day)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	0	2	2	1	4	16	5	26
6:15-6:30	5	2	0	3	10	0	0	8	4	12
6:30-6:45	1	0	2	4	7	0	1	5	3	9
6:45-7:00	5	0	6	2	13	0	1	1	6	8
7:00-7:15	3	0	1	1	5	1	1	5	3	10
7:15-7:30	3	0	3	0	6	0	0	2	2	4
7:30-7:45	6	4	5	1	16	1	2	1	0	4
7:45-8:00	10	3	2	4	19	4	1	0	1	6
8:00-8:15	8	0	7	6	21	4	1	3	3	11
8:15-8:30	9	1	4	5	19	3	1	7	0	11
8:30-8:45	6	1	9	5	21	5	1	5	1	12
8:45-9:00	2	2	5	6	15	1	2	0	1	4
9:00-9:15	3	1	4	3	11	5	0	2	2	9
9:15-9:30	2	2	5	6	15	10	2	5	4	21
9:30-9:45	5	1	8	16	30	2	3	7	6	18
9:45-10:00	1	3	6	11	21	4	4	5	6	19
10:00-10:15	5	0	7	3	15	3	1	8	11	23
10:15-10:30	1	2	7	3	13	4	4	9	3	20
10:30-10:45	6	1	4	10	21	5	1	6	3	15
10:45-11:00	4	3	3	4	14	3	1	4	3	11
11:00-11:15	3	1	4	6	14	4	0	5	4	13
11:15-11:30	3	0	8	7	18	2	0	5	1	8
11:30-11:45	8	3	8	5	24	5	1	7	4	17
11:45-12:00	5	2	8	4	19	5	1	8	1	15
12:00-12:15	5	2	6	4	17	3	5	6	3	17
12:15-12:30	2	1	2	5	10	5	1	1	3	10
12:30-12:45	8	6	6	5	25	4	1	1	2	8
12:45-1:00	5	0	9	6	20	6	0	5	3	14
1:00-1:15	9	5	5	6	25	7	3	4	1	15
1:15-1:30	5	5	5	6	21	5	4	2	1	12
1:30-1:45	3	1	5	5	14	3	2	1	4	10
1:45-2:00	7	7	10	5	29	5	2	1	0	8
2:00-2:15	2	2	2	7	13	6	4	1	0	11
2:15-2:30	3	0	3	2	8	6	1	1	0	8
2:30-2:45	3	1	2	1	7	14	1	0	1	16
2:45-3:00	9	0	2	1	12	10	2	2	0	14
3:00-3:15	1	1	4	0	6	3	0	0	0	3
3:15-3:30	2	1	4	4	11	3	2	0	0	5
3:30-3:45	2	4	2	3	11	3	2	3	1	9
3:45-4:00	7	1	2	2	12	6	3	1	0	10
4:00-4:15	5	1	1	2	9	8	2	0	1	11
4:15-4:30	3	0	3	1	7	3	0	2	1	6
4:30-4:45	0	0	0	0	0	11	0	0	0	11
4:45-5:00	2	0	4	0	6	5	0	0	0	5
TOTALS	187	70	193	182	632	188	68	155	98	509

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM - 5:00 PM - Business Day)
SITE: SITE 3: Grand Central Recycling and Transfer Station (Industry, CA)
OPERATION: Approximately 1,400 tons per day
HOURS: Monday-Friday (6:00 AM - 4:00 PM); Saturday (6:00 AM - 2:00 PM); Typical peak occurs Monday's/Friday's

1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	11	2	8	11	32	1	6	30	18	55
6:15-7:15	14	2	9	10	35	1	3	19	16	39
6:30-7:30	12	0	12	7	31	1	3	13	14	31
6:45-7:45	17	4	15	4	40	2	4	9	11	26
7:00-8:00	22	7	11	6	46	6	4	8	6	24
7:15-8:15	27	7	17	11	62	9	4	6	6	25
7:30-8:30	33	8	18	16	75	12	5	11	4	32
7:45-8:45	**33**	**5**	**22**	**20**	**80**	**16**	**4**	**15**	**5**	**40**
8:00-9:00	25	4	25	22	76	13	5	15	5	38
8:15-9:15	20	5	22	19	66	14	4	14	4	36
8:30-9:30	13	6	23	20	62	21	5	12	8	46
8:45-9:45	12	6	22	31	71	18	7	14	13	52
9:00-10:00	11	7	23	36	77	21	9	19	18	67
9:15-10:15	**13**	**6**	**26**	**36**	**81**	**19**	**10**	**25**	**27**	**81**
9:30-10:30	12	6	28	33	79	13	12	29	26	80
9:45-10:45	13	6	24	27	70	16	10	28	23	77
10:00-11:00	16	6	21	20	63	15	7	27	20	69
10:15-11:15	14	7	18	23	62	16	6	24	13	59
10:30-11:30	16	5	19	27	67	14	2	20	11	47
10:45-11:45	18	7	23	22	70	14	2	21	12	49
11:00-12:00	19	6	28	22	75	16	2	25	10	53
11:15-12:15	21	7	30	20	78	15	7	26	9	57
11:30-12:30	20	8	24	18	70	18	8	22	11	59
11:45-12:45	20	11	22	18	71	17	8	16	9	50
12:00-1:00	20	9	23	20	72	18	7	13	11	49
12:15-1:15	24	12	22	22	80	22	5	11	9	47
12:30-1:30	27	16	25	23	91	22	8	12	7	49
12:45-1:45	22	11	24	23	80	21	9	12	9	51
1:00-2:00	24	18	25	22	89	20	11	8	6	45
1:15-2:15	17	15	22	23	77	19	12	5	5	41
1:30-2:30	15	10	20	19	64	20	9	4	4	37
1:45-2:45	15	10	17	15	57	31	8	3	1	43
2:00-3:00	17	3	9	11	40	36	8	4	1	49
2:15-3:15	16	2	11	4	33	33	4	3	1	41
2:30-3:30	15	3	12	6	36	30	5	2	1	38
2:45-3:45	14	6	12	8	40	19	6	5	1	31
3:00-4:00	12	7	12	9	40	15	7	4	1	27
3:15-4:15	**16**	**7**	**9**	**11**	**43**	**20**	**9**	**4**	**2**	**35**
3:30-4:30	17	6	8	8	39	20	7	6	3	36
3:45-4:45	15	2	6	5	28	28	5	3	2	38
4:00-5:00	10	1	8	3	22	27	2	2	2	33

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	0	0	1	0	1	1	0	0	0	1
6:15-6:30	0	1	3	0	4	0	0	2	2	4
6:30-6:45	2	3	1	0	6	1	0	2	2	5
6:45-7:00	2	0	0	0	2	1	2	1	2	6
7:00-7:15	1	1	0	0	2	4	0	0	2	6
7:15-7:30	1	0	0	0	1	0	1	1	4	6
7:30-7:45	2	0	0	0	2	1	0	1	0	2
7:45-8:00	0	0	0	0	0	1	1	6	1	9
8:00-8:15	3	0	0	0	3	0	0	1	0	1
8:15-8:30	3	0	0	0	3	3	0	3	0	6
8:30-8:45	2	1	0	0	3	4	0	2	2	8
8:45-9:00	2	3	0	1	6	0	0	3	3	6
9:00-9:15	1	2	1	0	4	3	2	3	3	11
9:15-9:30	3	0	6	0	9	3	2	2	1	8
9:30-9:45	2	0	6	0	8	1	1	5	2	9
9:45-10:00	1	2	2	0	5	1	0	6	4	11
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	4	4	5	0	13	3	2	5	6	16
6:15-7:15	5	5	4	0	14	6	2	5	8	21
6:30-7:30	6	4	1	0	11	6	3	4	10	23
6:45-7:45	6	1	0	0	7	6	3	3	8	20
7:00-8:00	4	1	0	0	5	6	2	8	7	23
7:15-8:15	6	0	0	0	6	2	2	9	5	18
7:30-8:30	8	0	0	0	8	5	1	11	1	18
7:45-8:45	8	1	0	0	9	8	1	12	3	24
8:00-9:00	10	4	0	1	15	7	0	9	5	21
8:15-9:15	8	6	1	1	16	10	2	11	8	31
8:30-9:30	8	6	7	1	22	10	4	10	9	33
8:45-9:45	8	5	13	1	27	7	5	13	9	34
9:00-10:00	7	4	15	0	**26**	8	5	16	10	**39**

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 10, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	0	2	6	0	8	5	0	6	2	13
3:15-3:30	3	1	8	0	12	3	1	7	2	13
3:30-3:45	1	4	11	0	16	3	4	8	2	17
3:45-4:00	2	2	2	0	6	2	1	9	2	14
4:00-4:15	2	2	5	0	9	1	4	3	3	11
4:15-4:30	5	1	11	0	17	2	1	5	1	9
4:30-4:45	1	1	11	0	13	5	1	6	0	12
4:45-5:00	3	1	14	0	18	2	0	12	0	14
5:00-5:15	0	0	7	0	7	3	1	14	0	18
5:15-5:30	0	1	16	0	17	1	0	7	0	8
5:30-5:45	0	0	16	0	16	0	0	15	0	15
5:45-6:00	1	0	10	0	11	1	0	12	0	13
6:00-6:15	0	0	3	0	3	0	1	8	0	9
6:15-6:30	0	0	1	0	1	1	0	7	0	8
6:30-6:45	0	0	1	0	1	0	0	1	0	1
6:45-7:00	0	0	0	0	0	0	0	0	0	0
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	6	9	27	0	42	13	6	30	8	57
3:15-4:15	8	9	26	0	43	9	10	27	9	55
3:30-4:30	10	9	29	0	48	8	10	25	8	51
3:45-4:45	10	6	29	0	45	10	7	23	6	46
4:00-5:00	11	5	41	0	57	10	6	26	4	46
4:15-5:15	9	3	43	0	55	12	3	37	1	53
4:30-5:30	4	3	48	0	55	11	2	39	0	52
4:45-5:45	3	2	53	0	**58**	6	1	48	0	**55**
5:00-6:00	1	1	49	0	51	5	1	48	0	54
5:15-6:15	1	1	45	0	47	2	1	42	0	45
5:30-6:30	1	0	30	0	31	2	1	42	0	45
5:45-6:45	1	0	15	0	16	2	1	28	0	31
6:00-7:00	0	0	5	0	5	1	1	16	0	18

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	1	2	1	0	4	0	2	1	2	5
6:15-6:30	0	0	3	0	3	1	3	8	4	16
6:30-6:45	1	0	1	0	2	1	1	7	4	13
6:45-7:00	0	0	1	0	1	0	0	6	7	13
7:00-7:15	0	3	1	0	4	1	1	7	5	14
7:15-7:30	3	0	2	0	5	1	2	3	3	9
7:30-7:45	1	1	4	0	6	0	1	4	3	8
7:45-8:00	2	0	1	0	3	2	1	8	3	14
8:00-8:15	3	0	7	0	10	2	0	3	5	10
8:15-8:30	4	1	1	0	6	3	2	3	5	13
8:30-8:45	2	0	5	1	8	6	1	4	5	16
8:45-9:00	2	0	3	0	5	2	0	3	7	12
9:00-9:15	4	1	1	0	6	3	0	4	6	13
9:15-9:30	3	2	6	0	11	3	0	3	3	9
9:30-9:45	2	0	6	0	8	2	4	8	2	16
9:45-10:00	4	2	2	0	8	3	2	7	1	13
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	2	2	6	0	10	2	6	22	17	47
6:15-7:15	1	3	6	0	10	3	5	28	20	56
6:30-7:30	4	3	5	0	12	3	4	23	19	49
6:45-7:45	4	4	8	0	16	2	4	20	18	44
7:00-8:00	6	4	8	0	18	4	5	22	14	45
7:15-8:15	9	1	14	0	24	5	4	18	14	41
7:30-8:30	10	2	13	0	25	7	4	18	16	45
7:45-8:45	11	1	14	1	27	13	4	18	18	53
8:00-9:00	11	1	16	1	29	13	3	13	22	51
8:15-9:15	12	2	10	1	25	14	3	14	23	54
8:30-9:30	11	3	15	1	30	14	1	14	21	50
8:45-9:45	11	3	16	0	30	10	4	18	18	50
9:00-10:00	13	5	15	0	**33**	11	6	22	12	**51**

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 11, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	5	2	8	0	15	4	0	4	2	10
3:15-3:30	2	1	7	0	10	4	3	7	3	17
3:30-3:45	3	2	11	0	16	2	0	4	2	8
3:45-4:00	1	2	13	0	16	4	1	14	3	22
4:00-4:15	4	3	17	0	24	4	1	9	3	17
4:15-4:30	5	0	18	0	23	2	0	11	2	15
4:30-4:45	1	2	11	0	14	3	1	12	1	17
4:45-5:00	1	2	17	0	20	3	1	5	0	9
5:00-5:15	0	0	18	0	18	1	0	13	0	14
5:15-5:30	0	0	9	0	9	3	0	8	0	11
5:30-5:45	1	0	13	0	14	0	0	17	0	17
5:45-6:00	2	0	10	0	12	0	0	9	0	9
1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-4:00	11	7	39	0	57	14	4	29	10	57
3:15-4:15	10	8	48	0	66	14	5	34	11	64
3:30-4:30	13	7	59	0	79	12	2	38	10	62
3:45-4:45	11	7	59	0	**77**	13	3	46	9	**71**
4:00-5:00	11	7	63	0	81	12	3	37	6	58
4:15-5:15	7	4	64	0	75	9	2	41	3	55
4:30-5:30	2	4	55	0	61	10	2	38	1	51
4:45-5:45	2	2	57	0	61	7	1	43	0	51
5:00-6:00	3	0	50	0	53	4	0	47	0	51

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: AM Peak Period (7:00 AM - 9:00 AM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	5	0	1	0	6	2	1	3	2	8
6:15-6:30	3	0	0	0	3	2	1	10	3	16
6:30-6:45	1	0	4	0	5	4	0	2	5	11
6:45-7:00	4	0	1	0	5	3	1	12	3	19
7:00-7:15	1	0	4	0	5	2	1	9	5	17
7:15-7:30	2	0	2	0	4	3	1	5	3	12
7:30-7:45	1	0	2	1	4	2	0	4	0	6
7:45-8:00	4	0	2	1	7	2	0	1	1	4
8:00-8:15	2	1	2	0	5	4	0	2	3	9
8:15-8:30	2	0	4	0	6	2	1	5	5	13
8:30-8:45	0	0	2	1	3	2	0	5	5	12
8:45-9:00	1	0	2	0	3	2	1	2	5	10
9:00-9:15	2	0	0	0	2	1	0	4	3	8
9:15-9:30	3	1	3	0	7	3	0	0	2	5
9:30-9:45	3	0	1	0	4	0	0	4	6	10
9:45-10:00	1	0	7	0	8	1	2	4	5	12
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
6:00-7:00	13	0	6	0	19	11	3	27	13	54
6:15-7:15	9	0	9	0	**18**	11	3	33	16	**63**
6:30-7:30	8	0	11	0	19	12	3	28	16	59
6:45-7:45	8	0	9	1	18	10	3	30	11	54
7:00-8:00	8	0	10	2	20	9	2	19	9	39
7:15-8:15	9	1	8	2	20	11	1	12	7	31
7:30-8:30	9	1	10	2	22	10	1	12	9	32
7:45-8:45	8	1	10	2	21	10	1	13	14	38
8:00-9:00	5	1	10	1	17	10	2	14	18	44
8:15-9:15	5	0	8	1	14	7	2	16	18	43
8:30-9:30	6	1	7	1	15	8	1	11	15	35
8:45-9:45	9	1	6	0	16	6	1	10	16	33
9:00-10:00	9	1	11	0	21	5	2	12	16	35

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: PM Peak Period (4:00 PM - 6:00 PM)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
3:00-3:15	2	4	7	0	13	3	2	6	4	15
3:15-3:30	0	2	7	0	9	1	1	5	3	10
3:30-3:45	3	3	14	0	20	2	1	8	4	15
3:45-4:00	2	1	14	0	17	1	3	13	2	19
4:00-4:15	3	3	16	0	22	1	0	8	1	10
4:15-4:30	2	2	14	0	18	1	3	12	0	16
4:30-4:45	0	1	16	0	17	2	1	10	0	13
4:45-5:00	5	0	17	0	22	0	0	8	0	8
5:00-5:15	2	1	11	0	14	4	0	12	0	16
5:15-5:30	2	0	11	0	13	4	0	12	0	16
5:30-5:45	0	0	9	0	9	2	0	5	0	7
5:45-6:00	3	1	9	0	13	1	0	10	0	11
6:00-6:15	1	0	11	0	12	2	1	10	0	13
6:15-6:30	1	1	3	0	5	1	1	4	0	6
1-HOUR	**INBOUND**					**OUTBOUND**				
TOTALS	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**	**CARS**	**2-AXLE**	**3-AXLE**	**4+-AXLE**	**TOTAL**
3:00-4:00	7	10	42	0	59	7	7	32	13	59
3:15-4:15	8	9	51	0	68	5	5	34	10	54
3:30-4:30	10	9	58	0	**77**	5	7	41	7	**60**
3:45-4:45	7	7	60	0	74	5	7	43	3	58
4:00-5:00	10	6	63	0	79	4	4	38	1	47
4:15-5:15	9	4	58	0	71	7	4	42	0	53
4:30-5:30	9	2	55	0	66	10	1	42	0	53
4:45-5:45	9	1	48	0	58	10	0	37	0	47
5:00-6:00	7	2	40	0	49	11	0	39	0	50
5:15-6:15	6	1	40	0	47	9	1	37	0	47
5:30-6:30	5	2	32	0	39	6	2	29	0	37

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM -6:15 PM - Business Day)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

15-MINUTE	INBOUND					OUTBOUND				
INTERVALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-6:15	5	0	1	0	6	2	1	3	2	8
6:15-6:30	3	0	0	0	3	2	1	10	3	16
6:30-6:45	1	0	4	0	5	4	0	2	5	11
6:45-7:00	4	0	1	0	5	3	1	12	3	19
7:00-7:15	1	0	4	0	5	2	1	9	5	17
7:15-7:30	2	0	2	0	4	3	1	5	3	12
7:30-7:45	1	0	2	1	4	2	0	4	0	6
7:45-8:00	4	0	2	1	7	2	0	1	1	4
8:00-8:15	2	1	2	0	5	4	0	2	3	9
8:15-8:30	2	0	4	0	6	2	1	5	5	13
8:30-8:45	0	0	2	1	3	2	0	5	5	12
8:45-9:00	1	0	2	0	3	2	1	2	5	10
9:00-9:15	2	0	0	0	2	1	0	4	3	8
9:15-9:30	3	1	3	0	7	3	0	0	2	5
9:30-9:45	3	0	1	0	4	0	0	4	6	10
9:45-10:00	1	0	7	0	8	1	2	4	5	12
10:00-10:15	4	0	8	0	12	2	0	6	2	10
10:15-10:30	4	0	10	0	14	1	0	9	4	14
10:30-10:45	1	1	6	0	8	4	1	8	3	16
10:45-11:00	1	2	6	1	10	1	1	10	4	16
11:00-11:15	5	0	7	0	12	2	1	6	4	13
11:15-11:30	2	0	6	0	8	2	0	8	2	12
11:30-11:45	0	0	5	0	5	4	1	7	3	15
11:45-12:00	5	0	7	0	12	2	0	7	4	13
12:00-12:15	5	0	8	0	13	3	1	3	2	9
12:15-12:30	2	1	13	0	16	7	1	10	1	19
12:30-12:45	4	3	4	0	11	2	1	13	2	18
12:45-1:00	3	1	7	2	13	4	1	6	4	15
1:00-1:15	5	2	4	1	12	3	2	6	2	13
1:15-1:30	2	1	4	0	7	4	1	3	5	13
1:30-1:45	3	1	4	2	10	6	0	6	4	16
1:45-2:00	3	2	6	0	11	2	2	5	4	13
2:00-2:15	1	1	8	0	10	3	1	7	4	15
2:15-2:30	2	0	5	0	7	4	3	7	4	18
2:30-2:45	6	2	5	1	14	2	2	6	2	12
2:45-3:00	2	1	5	0	8	0	1	2	1	4
3:00-3:15	2	4	7	0	13	3	2	6	4	15
3:15-3:30	0	2	7	0	9	1	1	5	3	10
3:30-3:45	3	3	14	0	20	2	1	8	4	15
3:45-4:00	2	1	14	0	17	1	3	13	2	19
4:00-4:15	3	3	16	0	22	1	0	8	1	10
4:15-4:30	2	2	14	0	18	1	3	12	0	16
4:30-4:45	0	1	16	0	17	2	1	10	0	13
4:45-5:00	5	0	17	0	22	0	0	8	0	8
5:00-5:15	2	1	11	0	14	4	0	12	0	16
5:15-5:30	2	0	11	0	13	4	0	12	0	16
5:30-5:45	0	0	9	0	9	2	0	5	0	7
5:45-6:00	3	1	9	0	13	1	0	10	0	11
6:00-6:15	1	0	11	0	12	2	1	10	0	13
6:15-6:30	1	1	3	0	5	1	1	4	0	6
TOTALS	121	39	324	10	494	118	42	330	131	621

DRIVEWAY COUNT DATA SUMMARY

PROJECT: Grand Central Waste Transfer Station (JN 06562)
DATE: March 12, 2009
PERIOD: Daily (6:00 AM -6:15 PM - Business Day)
SITE: SITE 4: Sunset Environmental, Inc. Transfer Facility (Irvine, CA)
OPERATION: Approximately 3,000 tons per day
HOURS: Monday-Friday (5:30 AM - 7:00 PM); Saturday (7:00 AM - 2:00 PM); Typical peak occurs Monday's/Tuesday's

1-HOUR	INBOUND					OUTBOUND				
TOTALS	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL	CARS	2-AXLE	3-AXLE	4+-AXLE	TOTAL
6:00-7:00	13	0	6	0	19	11	3	27	13	54
6:15-7:15	9	0	9	0	18	11	3	33	16	63
6:30-7:30	8	0	11	0	19	12	3	28	16	59
6:45-7:45	8	0	9	1	18	10	3	30	11	54
7:00-8:00	8	0	10	2	20	9	2	19	9	39
7:15-8:15	9	1	8	2	20	11	1	12	7	31
7:30-8:30	9	1	10	2	22	10	1	12	9	32
7:45-8:45	8	1	10	2	21	10	1	13	14	38
8:00-9:00	**5**	**1**	**10**	**1**	**17**	**10**	**2**	**14**	**18**	**44**
8:15-9:15	5	0	8	1	14	7	2	16	18	43
8:30-9:30	6	1	7	1	15	8	1	11	15	35
8:45-9:45	9	1	6	0	16	6	1	10	16	33
9:00-10:00	9	1	11	0	21	5	2	12	16	35
9:15-10:15	11	1	19	0	31	6	2	14	15	37
9:30-10:30	12	0	26	0	38	4	2	23	17	46
9:45-10:45	10	1	31	0	42	8	3	27	14	52
10:00-11:00	10	3	30	1	44	8	2	33	13	56
10:15-11:15	11	3	29	1	44	8	3	33	15	59
10:30-11:30	9	3	25	1	38	9	3	32	13	57
10:45-11:45	8	2	24	1	35	9	3	31	13	56
11:00-12:00	12	0	25	0	37	10	2	28	13	53
11:15-12:15	12	0	26	0	38	11	2	25	11	49
11:30-12:30	12	1	33	0	46	16	3	27	10	56
11:45-12:45	16	4	32	0	52	14	3	33	9	59
12:00-1:00	14	5	32	2	53	16	4	32	9	61
12:15-1:15	14	7	28	3	52	16	5	35	9	65
12:30-1:30	14	7	19	3	43	13	5	28	13	59
12:45-1:45	13	5	19	5	42	17	4	21	15	57
1:00-2:00	13	6	18	3	40	15	5	20	15	55
1:15-2:15	9	5	22	2	38	15	4	21	17	57
1:30-2:30	9	4	23	2	38	15	6	25	16	62
1:45-2:45	12	5	24	1	42	11	8	25	14	58
2:00-3:00	11	4	23	1	39	9	7	22	11	49
2:15-3:15	12	7	22	1	42	9	8	21	11	49
2:30-3:30	10	9	24	1	44	6	6	19	10	41
2:45-3:45	7	10	33	0	50	6	5	21	12	44
3:00-4:00	7	10	42	0	59	7	7	32	13	59
3:15-4:15	8	9	51	0	68	5	5	34	10	54
3:30-4:30	**10**	**9**	**58**	**0**	**77**	**5**	**7**	**41**	**7**	**60**
3:45-4:45	7	7	60	0	74	5	7	43	3	58
4:00-5:00	**10**	**6**	**63**	**0**	**79**	**4**	**4**	**38**	**1**	**47**
4:15-5:15	9	4	58	0	71	7	4	42	0	53
4:30-5:30	9	2	55	0	66	10	1	42	0	53
4:45-5:45	9	1	48	0	58	10	0	37	0	47
5:00-6:00	7	2	40	0	49	11	0	39	0	50
5:15-6:15	6	1	40	0	47	9	1	37	0	47
5:30-6:30	5	2	32	0	39	6	2	29	0	37

APPENDIX B:

DAILY TRAFFIC COUNT DATA

Prepared by National Data & Surveying Services

CLASSIFICATION

Arrow Hwy 600' n/o Live Oak Ave (East)

Days: Tuesday & Wednesday & Thursday
Dates: 05/05/2015 & 05/06/2015 & 05/07/2015

City: Irwindale
Project #: CA15_5207_035

3-DAY AVERAGE

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	81	8	0	3	0	0	0	0	0	0	0	0	92
01:00	0	45	3	0	3	0	0	0	1	0	0	0	0	52
02:00	0	38	6	0	5	0	0	1	0	0	0	0	0	50
03:00	0	50	6	1	6	0	0	0	0	0	1	0	0	64
04:00	0	109	16	5	9	0	0	0	0	0	0	0	0	139
05:00	0	427	85	7	68	0	0	6	0	0	1	0	0	594
06:00	0	1030	194	7	136	3	0	17	0	0	1	0	0	1388
07:00	1	1657	238	14	159	4	0	14	0	0	0	0	0	2087
08:00	0	1130	159	12	123	6	0	11	2	0	0	0	0	1443
09:00	1	582	109	3	91	3	0	6	0	0	1	0	0	796
10:00	0	466	95	8	78	2	0	6	1	0	0	0	0	656
11:00	0	502	97	8	69	4	0	7	2	0	0	0	0	689
12:00 PM	0	541	99	7	85	5	0	7	1	0	1	0	0	746
13:00	0	598	109	7	91	5	0	9	1	0	0	0	0	820
14:00	1	773	120	6	115	3	0	16	2	0	4	0	0	1040
15:00	0	920	165	9	144	3	1	13	2	0	2	0	0	1259
16:00	1	1091	178	6	126	4	2	9	0	0	0	0	0	1417
17:00	1	1197	157	5	122	2	1	10	1	0	0	0	0	1496
18:00	0	860	106	4	77	0	0	6	1	0	0	0	0	1054
19:00	0	482	74	1	38	0	0	0	0	0	0	0	0	595
20:00	0	345	42	1	24	0	0	0	0	0	0	0	0	412
21:00	0	282	35	2	19	0	0	0	0	0	0	0	0	338
22:00	0	204	20	0	13	0	0	0	0	0	0	0	0	237
23:00	0	116	10	1	6	0	0	0	0	0	0	0	0	133
Totals	5	13526	2131	114	1610	44	4	138	14		11			17597
% of Totals	0%	77%	12%	1%	9%	0%	0%	1%	0%		0%			100%

AM Volumes	2	6117	1016	65	750	22	0	68	6	0	4	0	0	8050
% AM	0%	35%	6%	0%	4%	0%		0%	0%		0%			46%
AM Peak Hour	07:00	07:00	07:00	07:00	07:00	08:00		06:00	08:00		03:00			07:00
Volume	1	1657	238	14	159	6		17	2		1			2087
PM Volumes	3	7409	1115	49	860	22	4	70	8	0	7	0	0	9547
% PM	0%	42%	6%	0%	5%	0%	0%	0%	0%		0%			54%
PM Peak Hour	14:00	17:00	16:00	15:00	15:00	12:00	16:00	14:00	14:00		14:00			17:00
Volume	1	1197	178	9	144	5	2	16	2		4			1496

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	3530		20%	1566		9%	2913		17%	9588		54%

Classification Definitions

1 Motorcycles	**4** Buses	**7** > =4-Axle Single Units	**10** >=6-Axle Single Trailers	**13** >=7-Axle Multi-Trailers
2 Passenger Cars	**5** 2-Axle, 6-Tire Single Units	**8** <=4-Axle Single Trailers	**11** <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	**6** 3-Axle Single Units	**9** 5-Axle Single Trailers	**12** 6-Axle Multi-Trailers	

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Arrow Hwy 600' n/o Live Oak Ave (East)

Days: Tuesday & Wednesday & Thursday
Dates: 05/05/2015 & 05/06/2015 & 05/07/2015

3-DAY AVERAGE

City: Irwindale
Project #: CA15_5207_035

DAILY TOTALS	NB	SB	EB	WB	Total
	9,670	7,927	0	0	17,597

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	11		20		0	0	31		12:00	95		98		0	0	193	
00:15	8		13		0	0	21		12:15	94		92		0	0	186	
00:30	8		11		0	0	19		12:30	86		97		0	0	183	
00:45	11	38	10	54	0	0	21	92	12:45	89	364	95	382	0	0	184	746
01:00	5		7		0	0	12		13:00	90		91		0	0	181	
01:15	8		7		0	0	15		13:15	91		94		0	0	185	
01:30	6		7		0	0	13		13:30	121		112		0	0	233	
01:45	5	24	7	28	0	0	12	52	13:45	109	411	112	409	0	0	221	820
02:00	4		8		0	0	12		14:00	106		111		0	0	217	
02:15	6		9		0	0	15		14:15	102		129		0	0	231	
02:30	3		10		0	0	13		14:30	138		156		0	0	294	
02:45	6	19	4	31	0	0	10	50	14:45	126	472	172	568	0	0	298	1040
03:00	9		5		0	0	14		15:00	105		155		0	0	260	
03:15	10		5		0	0	15		15:15	124		197		0	0	321	
03:30	11		7		0	0	18		15:30	128		221		0	0	349	
03:45	11	41	6	23	0	0	17	64	15:45	115	472	214	787	0	0	329	1259
04:00	9		8		0	0	17		16:00	127		216		0	0	343	
04:15	15		6		0	0	21		16:15	113		241		0	0	354	
04:30	27		10		0	0	37		16:30	119		250		0	0	369	
04:45	43	94	21	45	0	0	64	139	16:45	100	459	251	958	0	0	351	1417
05:00	51		20		0	0	71		17:00	119		271		0	0	390	
05:15	83		24		0	0	107		17:15	118		284		0	0	402	
05:30	147		36		0	0	183		17:30	110		251		0	0	361	
05:45	192	473	41	121	0	0	233	594	17:45	98	445	245	1051	0	0	343	1496
06:00	205		37		0	0	242		18:00	99		202		0	0	301	
06:15	263		38		0	0	301		18:15	95		205		0	0	300	
06:30	340		54		0	0	394		18:30	81		156		0	0	237	
06:45	385	1193	66	195	0	0	451	1388	18:45	80	355	136	699	0	0	216	1054
07:00	431		56		0	0	487		19:00	72		109		0	0	181	
07:15	492		72		0	0	564		19:15	67		91		0	0	158	
07:30	463		91		0	0	554		19:30	54		79		0	0	133	
07:45	367	1753	115	334	0	0	482	2087	19:45	44	237	79	358	0	0	123	595
08:00	320		102		0	0	422		20:00	49		63		0	0	112	
08:15	295		108		0	0	403		20:15	48		62		0	0	110	
08:30	240		93		0	0	333		20:30	42		59		0	0	101	
08:45	206	1061	79	382	0	0	285	1443	20:45	47	186	42	226	0	0	89	412
09:00	152		73		0	0	225		21:00	45		43		0	0	88	
09:15	136		73		0	0	209		21:15	39		49		0	0	88	
09:30	114		60		0	0	174		21:30	40		43		0	0	83	
09:45	110	512	78	284	0	0	188	796	21:45	34	158	45	180	0	0	79	338
10:00	96		73		0	0	169		22:00	35		39		0	0	74	
10:15	99		71		0	0	170		22:15	24		29		0	0	53	
10:30	85		68		0	0	153		22:30	23		37		0	0	60	
10:45	99	379	65	277	0	0	164	656	22:45	20	102	30	135	0	0	50	237
11:00	88		78		0	0	166		23:00	15		21		0	0	36	
11:15	98		86		0	0	184		23:15	14		17		0	0	31	
11:30	97		79		0	0	176		23:30	10		24		0	0	34	
11:45	88	371	75	318	0	0	163	689	23:45	12	51	20	82	0	0	32	133
TOTALS		5958		2092				8050	TOTALS		3712		5835				9547
SPLIT %		74.0%		26.0%				45.7%	SPLIT %		38.9%		61.1%				54.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	9,670	7,927	0	0	17,597

AM Peak Hour	06:45	07:45			07:00	PM Peak Hour	15:15	16:45			16:30
AM Pk Volume	1771	418			2087	PM Pk Volume	494	1057			1512
Pk Hr Factor	0.900	0.909			0.925	Pk Hr Factor	0.933	0.864			0.940
7 - 9 Volume	2814	716	0	0	3530	4 - 6 Volume	904	2009	0	0	2913
7 - 9 Peak Hour	07:00	07:45			07:00	4 - 6 Peak Hour	16:00	16:45			16:30
7 - 9 Pk Volume	1753	418	0	0	2087	4 - 6 Pk Volume	459	1057	0	0	1512
Pk Hr Factor	0.891	0.909	0.000	0.000	0.925	Pk Hr Factor	0.904	0.930	0.000	0.000	0.940

Prepared by NDS/ATD

Project #: CA15_5207_035 **City:** Irwindale

Location: Arrow Hwy 600' n/o Live Oak Ave (East) **Dates:** 05/05/2015 & 05/06/2015 & 05/07/2015

3-DAY AVERAGE



Prepared by National Data & Surveying Services

CLASSIFICATION

Live Oak Ave (East) 500' w/o Maine Ave

Days: Tuesday & Wednesday & Thursday
Dates: 05/05/2015 & 05/06/2015 & 05/07/2015

City: Irwindale
Project #: CA15_5207_036

3-DAY AVERAGE

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	161	20	1	8	1	0	0	0	0	0	0	0	191
01:00	0	109	12	1	6	0	0	1	2	0	0	0	0	131
02:00	0	106	18	2	14	2	0	3	0	0	0	0	0	145
03:00	0	170	29	1	23	1	0	2	1	0	2	0	0	229
04:00	0	338	62	0	76	2	0	6	1	0	10	0	0	495
05:00	2	852	194	9	162	7	0	12	9	0	6	0	0	1253
06:00	2	1283	229	13	197	27	0	14	10	0	4	0	0	1779
07:00	3	1668	229	18	185	18	2	16	17	0	2	0	0	2158
08:00	6	1410	215	23	224	24	4	26	16	0	24	0	1	1973
09:00	2	950	175	25	193	23	6	22	20	1	23	0	0	1440
10:00	4	747	188	29	218	28	11	25	20	0	25	0	1	1296
11:00	6	838	184	31	219	23	6	22	20	0	18	0	0	1367
12:00 PM	8	1047	182	36	211	30	8	25	18	0	16	0	0	1581
13:00	4	1086	209	28	232	26	4	29	20	0	13	0	0	1651
14:00	10	1366	278	31	268	26	11	31	28	0	18	0	3	2070
15:00	10	1661	330	28	257	30	9	17	22	0	10	1	2	2377
16:00	7	1982	340	17	213	21	5	14	12	1	3	1	2	2618
17:00	7	2333	286	10	164	14	3	12	10	0	2	0	2	2843
18:00	4	1908	223	14	112	5	1	9	6	0	0	0	0	2282
19:00	1	1044	136	15	67	0	0	6	3	0	0	0	0	1272
20:00	3	680	86	9	47	1	0	7	1	0	0	0	0	834
21:00	1	567	67	6	36	0	0	0	3	0	0	0	0	680
22:00	2	435	49	2	23	2	0	2	1	0	0	0	0	516
23:00	0	318	32	1	14	0	0	2	2	0	0	0	0	369
Totals	82	23059	3773	350	3169	311	70	303	242	2	176	2	11	31550
% of Totals	0%	73%	12%	1%	10%	1%	0%	1%	1%	0%	1%	0%	0%	100%

AM Volumes	25	8632	1555	153	1525	156	29	149	116	1	114	0	2	12457
% AM	0%	27%	5%	0%	5%	0%	0%	0%	0%	0%	0%		0%	39%
AM Peak Hour	08:00	07:00	06:00	11:00	08:00	10:00	10:00	08:00	09:00	09:00	10:00		08:00	07:00
Volume	6	1668	229	31	224	28	11	26	20	1	25		1	2158
PM Volumes	57	14427	2218	197	1644	155	41	154	126	1	62	2	9	19093
% PM	0%	46%	7%	1%	5%	0%	0%	0%	0%	0%	0%	0%	0%	61%
PM Peak Hour	14:00	17:00	16:00	12:00	14:00	12:00	14:00	14:00	14:00	16:00	14:00	15:00	14:00	17:00
Volume	10	2333	340	36	268	30	11	31	28	1	18	1	3	2843

Directional Peak Periods	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
All Classes	Volume	%	Volume	%	Volume	%	Volume	%
	4131 ⟷	13%	3232 ⟷	10%	5461 ⟷	17%	18726 ⟷	59%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Live Oak Ave (East) 500' w/o Maine Ave

Days: Tuesday & Wednesday & Thursday
Dates: 05/05/2015 & 05/06/2015 & 05/07/2015

3-DAY AVERAGE

City: Irwindale
Project #: CA15_5207_036

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	19,432	12,118	31,550

AM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0		40		25		65	
00:15	0		0		37		22		59	
00:30	0		0		22		10		32	
00:45	0		0		25	124	10	67	35	191
01:00	0		0		20		27		47	
01:15	0		0		14		13		27	
01:30	0		0		20		11		31	
01:45	0		0		14	68	12	63	26	131
02:00	0		0		19		11		30	
02:15	0		0		17		14		31	
02:30	0		0		24		15		39	
02:45	0		0		22	82	23	63	45	145
03:00	0		0		22		18		40	
03:15	0		0		28		24		52	
03:30	0		0		30		31		61	
03:45	0		0		35	115	41	114	76	229
04:00	0		0		29		42		71	
04:15	0		0		39		49		88	
04:30	0		0		69		80		149	
04:45	0		0		103	240	84	255	187	495
05:00	0		0		87		116		203	
05:15	0		0		111		163		274	
05:30	0		0		160		192		352	
05:45	0		0		195	553	229	700	424	1253
06:00	0		0		130		219		349	
06:15	0		0		143		275		418	
06:30	0		0		187		341		528	
06:45	0		0		199	659	285	1120	484	1779
07:00	0		0		171		320		491	
07:15	0		0		201		332		533	
07:30	0		0		224		316		540	
07:45	0		0		316	912	278	1246	594	2158
08:00	0		0		286		269		555	
08:15	0		0		276		238		514	
08:30	0		0		236		255		491	
08:45	0		0		208	1006	205	967	413	1973
09:00	0		0		199		189		388	
09:15	0		0		179		169		348	
09:30	0		0		196		166		362	
09:45	0		0		183	757	159	683	342	1440
10:00	0		0		190		133		323	
10:15	0		0		174		134		308	
10:30	0		0		198		155		353	
10:45	0		0		184	746	128	550	312	1296
11:00	0		0		199		140		339	
11:15	0		0		197		124		321	
11:30	0		0		206		136		342	
11:45	0		0		227	829	138	538	365	1367
TOTALS						6091		6366		12457
SPLIT %						48.9%		51.1%		39.5%

PM Period	NB		SB		EB		WB		TOTAL	
12:00	0		0		242		149		391	
12:15	0		0		235		146		381	
12:30	0		0		248		149		397	
12:45	0		0		256	981	156	600	412	1581
13:00	0		0		230		168		398	
13:15	0		0		233		160		393	
13:30	0		0		240		182		422	
13:45	0		0		268	971	170	680	438	1651
14:00	0		0		298		162		460	
14:15	0		0		321		166		487	
14:30	0		0		349		213		562	
14:45	0		0		374	1342	187	728	561	2070
15:00	0		0		380		158		538	
15:15	0		0		433		146		579	
15:30	0		0		446		190		636	
15:45	0		0		467	1726	157	651	624	2377
16:00	0		0		469		163		632	
16:15	0		0		491		151		642	
16:30	0		0		496		213		709	
16:45	0		0		497	1953	138	665	635	2618
17:00	0		0		515		205		720	
17:15	0		0		556		193		749	
17:30	0		0		548		174		722	
17:45	0		0		506	2125	146	718	652	2843
18:00	0		0		503		154		657	
18:15	0		0		459		118		577	
18:30	0		0		432		121		553	
18:45	0		0		387	1781	108	501	495	2282
19:00	0		0		297		107		404	
19:15	0		0		245		78		323	
19:30	0		0		197		84		281	
19:45	0		0		188	927	76	345	264	1272
20:00	0		0		155		71		226	
20:15	0		0		142		71		213	
20:30	0		0		140		71		211	
20:45	0		0		116	553	68	281	184	834
21:00	0		0		112		67		179	
21:15	0		0		105		59		164	
21:30	0		0		104		64		168	
21:45	0		0		102	423	67	257	169	680
22:00	0		0		94		50		144	
22:15	0		0		81		47		128	
22:30	0		0		90		48		138	
22:45	0		0		66	331	40	185	106	516
23:00	0		0		62		48		110	
23:15	0		0		52		29		81	
23:30	0		0		67		39		106	
23:45	0		0		47	228	25	141	72	369
TOTALS						13341		5752		19093
SPLIT %						69.9%		30.1%		60.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	19,432	12,118	31,550

AM Peak Hour			07:45	06:30	07:15
AM Pk Volume			1114	1278	2222
Pk Hr Factor			0.881	0.937	0.935
7 - 9 Volume	0	0	1918	2213	4131
7 - 9 Peak Hour			07:45	07:00	07:15
7 - 9 Pk Volume	0	0	1114	1246	2222
Pk Hr Factor	0.000	0.000	0.881	0.938	0.935

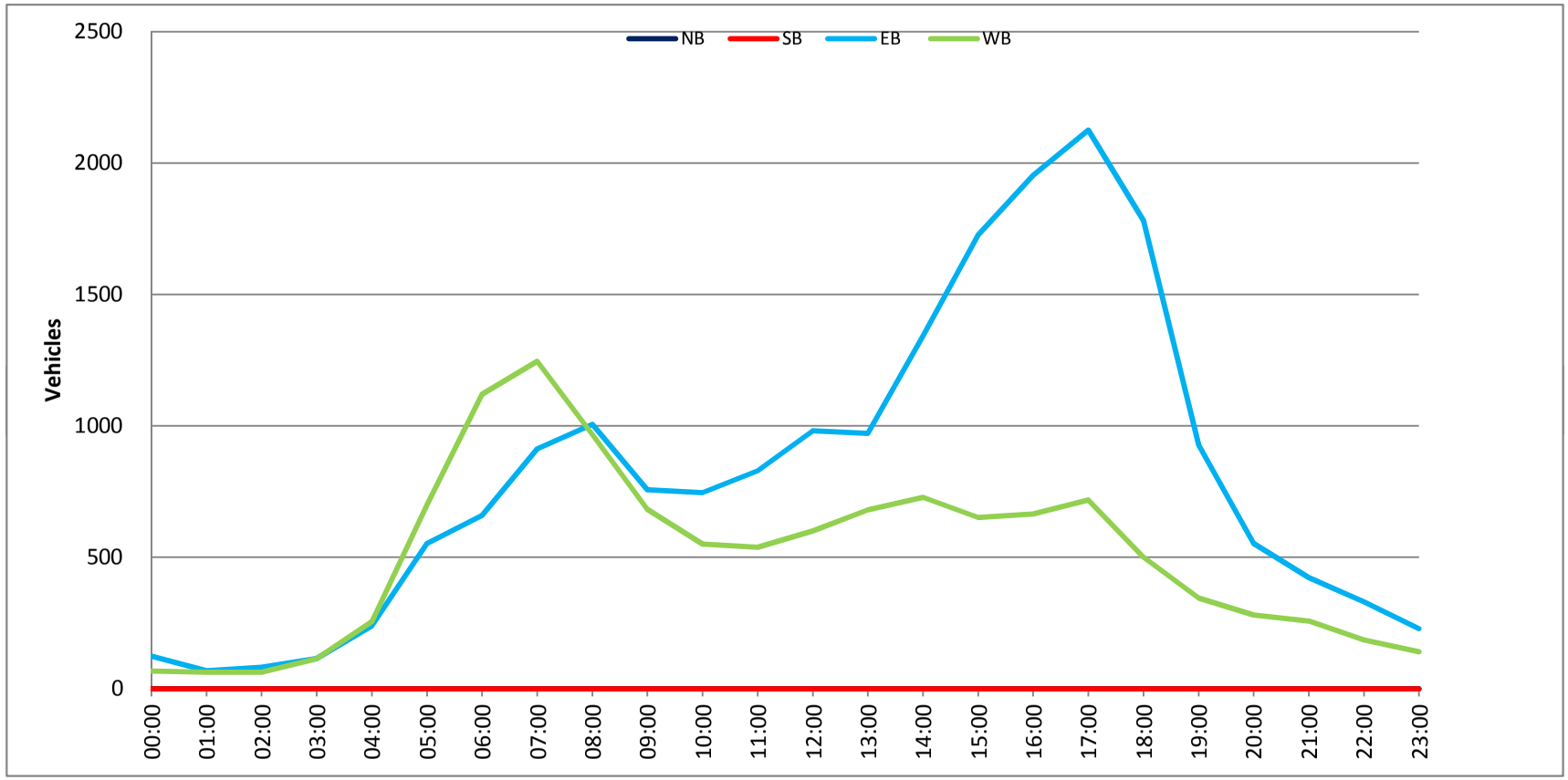
PM Peak Hour			17:00	16:30	17:00
PM Pk Volume			2016	749	2843
Pk Hr Factor			0.920	0.876	0.949
4 - 6 Volume	0	0	4078	1383	5461
4 - 6 Peak Hour			17:00	16:30	17:00
4 - 6 Pk Volume	0	0	2125	749	2843
Pk Hr Factor	0.000	0.000	0.955	0.879	0.949

Prepared by NDS/ATD

Project #: CA15_5207_036 **City:** Irwindale

Location: Live Oak Ave (East) 500' w/o Maine Ave **Dates:** 05/05/2015 & 05/06/2015 & 05/07/2015

3-DAY AVERAGE



Prepared by National Data & Surveying Services

CLASSIFICATION

Live Oak Ave 250' w/o Baldwin Park Blvd

Days: Tuesday & Wednesday & Thursday
Dates: 05/05/2015 & 05/06/2015 & 05/07/2015

City: Irwindale
Project #: CA15_5207_039

3-DAY AVERAGE

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	112	15	1	6	0	0	1	0	0	0	0	0	135
01:00	0	89	13	0	5	0	0	0	1	0	0	0	1	109
02:00	0	79	15	1	11	0	0	1	1	0	0	0	0	108
03:00	0	163	25	0	20	0	0	3	0	0	2	0	0	213
04:00	1	300	55	1	75	1	0	4	2	0	9	0	0	448
05:00	1	815	180	11	158	13	0	16	3	0	5	0	0	1202
06:00	4	1320	232	19	189	22	0	13	8	0	4	0	0	1811
07:00	1	1689	219	16	176	13	1	17	13	0	3	0	0	2148
08:00	4	1368	188	22	222	13	4	21	19	0	24	0	0	1885
09:00	2	866	146	26	191	15	3	25	17	0	16	0	0	1307
10:00	2	624	158	25	215	15	7	26	20	0	21	0	0	1113
11:00	2	695	154	33	211	16	2	21	16	0	19	0	0	1169
12:00 PM	4	923	142	34	200	15	5	20	17	0	17	0	0	1377
13:00	4	941	176	28	202	23	3	21	24	0	19	0	0	1441
14:00	9	1205	236	34	249	25	8	30	25	0	16	0	0	1837
15:00	4	1395	268	27	222	28	3	22	20	0	9	0	0	1998
16:00	8	1768	271	20	173	21	2	14	9	1	1	0	1	2289
17:00	8	1929	225	12	122	15	6	11	7	1	1	1	2	2340
18:00	4	1528	174	15	86	5	1	9	6	0	0	0	0	1828
19:00	1	837	95	14	51	1	0	5	4	0	0	0	0	1008
20:00	2	520	68	6	32	3	0	4	1	0	0	0	0	636
21:00	0	445	50	3	29	0	0	4	1	0	0	0	0	532
22:00	0	360	38	2	15	0	0	1	2	0	0	0	0	418
23:00	0	246	22	0	14	0	0	2	1	0	0	0	0	285
Totals	61	20217	3165	350	2874	244	45	291	217	2	166	1	4	27637
% of Totals	0%	73%	11%	1%	10%	1%	0%	1%	1%	0%	1%	0%	0%	100%

AM Volumes	17	8120	1400	155	1479	108	17	148	100	0	103	0	1	11648
% AM	0%	29%	5%	1%	5%	0%	0%	1%	0%		0%		0%	42%
AM Peak Hour	06:00	07:00	06:00	11:00	08:00	06:00	10:00	10:00	10:00		08:00		01:00	07:00
Volume	4	1689	232	33	222	22	7	26	20		24		1	2148
PM Volumes	44	12097	1765	195	1395	136	28	143	117	2	63	1	3	15989
% PM	0%	44%	6%	1%	5%	0%	0%	1%	0%	0%	0%	0%	0%	58%
PM Peak Hour	14:00	17:00	16:00	12:00	14:00	15:00	14:00	14:00	14:00	16:00	13:00	17:00	17:00	17:00
Volume	9	1929	271	34	249	28	8	30	25	1	19	1	2	2340

Directional Peak Periods	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
All Classes	Volume	%	Volume	%	Volume	%	Volume	%
	4033 ⟷	15%	2818 ⟷	10%	4629 ⟷	17%	16157 ⟷	58%

Classification Definitions

1 Motorcycles	**4** Buses	**7** > =4-Axle Single Units	**10** >=6-Axle Single Trailers	**13** >=7-Axle Multi-Trailers
2 Passenger Cars	**5** 2-Axle, 6-Tire Single Units	**8** <=4-Axle Single Trailers	**11** <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	**6** 3-Axle Single Units	**9** 5-Axle Single Trailers	**12** 6-Axle Multi-Trailers	

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Live Oak Ave 250' w/o Baldwin Park Blvd

Days: Tuesday & Wednesday & Thursday
Dates: 05/05/2015 & 05/06/2015 & 05/07/2015

3-DAY AVERAGE

City: Irwindale
Project #: CA15_5207_039

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	14,499	13,138	27,637

AM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0		27		23		50	
00:15	0		0		24		17		41	
00:30	0		0		12		8		20	
00:45	0		0		15	78	9	57	24	135
01:00	0		0		13		24		37	
01:15	0		0		8		18		26	
01:30	0		0		11		11		22	
01:45	0		0		9	41	15	68	24	109
02:00	0		0		10		11		21	
02:15	0		0		7		12		19	
02:30	0		0		15		13		28	
02:45	0		0		18	50	22	58	40	108
03:00	0		0		19		18		37	
03:15	0		0		22		25		47	
03:30	0		0		21		32		53	
03:45	0		0		30	92	46	121	76	213
04:00	0		0		23		43		66	
04:15	0		0		34		52		86	
04:30	0		0		55		82		137	
04:45	0		0		74	186	85	262	159	448
05:00	0		0		62		131		193	
05:15	0		0		86		175		261	
05:30	0		0		120		210		330	
05:45	0		0		151	419	267	783	418	1202
06:00	0		0		94		265		359	
06:15	0		0		110		321		431	
06:30	0		0		140		373		513	
06:45	0		0		139	483	369	1328	508	1811
07:00	0		0		124		390		514	
07:15	0		0		137		401		538	
07:30	0		0		169		377		546	
07:45	0		0		210	640	340	1508	550	2148
08:00	0		0		207		323		530	
08:15	0		0		203		299		502	
08:30	0		0		168		289		457	
08:45	0		0		153	731	243	1154	396	1885
09:00	0		0		129		214		343	
09:15	0		0		129		191		320	
09:30	0		0		150		181		331	
09:45	0		0		132	540	181	767	313	1307
10:00	0		0		128		149		277	
10:15	0		0		131		143		274	
10:30	0		0		130		164		294	
10:45	0		0		129	518	139	595	268	1113
11:00	0		0		135		138		273	
11:15	0		0		134		136		270	
11:30	0		0		160		146		306	
11:45	0		0		177	606	143	563	320	1169
TOTALS						4384		7264		11648
SPLIT %						37.6%		62.4%		42.1%

PM Period	NB		SB		EB		WB		TOTAL	
12:00	0		0		185		157		342	
12:15	0		0		175		155		330	
12:30	0		0		185		159		344	
12:45	0		0		189	734	172	643	361	1377
13:00	0		0		186		172		358	
13:15	0		0		169		170		339	
13:30	0		0		175		188		363	
13:45	0		0		201	731	180	710	381	1441
14:00	0		0		234		174		408	
14:15	0		0		243		172		415	
14:30	0		0		288		243		531	
14:45	0		0		271	1036	212	801	483	1837
15:00	0		0		310		164		474	
15:15	0		0		317		161		478	
15:30	0		0		349		192		541	
15:45	0		0		337	1313	168	685	505	1998
16:00	0		0		382		170		552	
16:15	0		0		400		148		548	
16:30	0		0		418		212		630	
16:45	0		0		415	1615	144	674	559	2289
17:00	0		0		424		206		630	
17:15	0		0		405		199		604	
17:30	0		0		406		167		573	
17:45	0		0		386	1621	147	719	533	2340
18:00	0		0		389		149		538	
18:15	0		0		350		121		471	
18:30	0		0		325		111		436	
18:45	0		0		274	1338	109	490	383	1828
19:00	0		0		245		105		350	
19:15	0		0		176		78		254	
19:30	0		0		129		84		213	
19:45	0		0		124	674	67	334	191	1008
20:00	0		0		112		66		178	
20:15	0		0		90		70		160	
20:30	0		0		80		68		148	
20:45	0		0		82	364	68	272	150	636
21:00	0		0		85		69		154	
21:15	0		0		64		59		123	
21:30	0		0		63		60		123	
21:45	0		0		66	278	66	254	132	532
22:00	0		0		70		46		116	
22:15	0		0		59		42		101	
22:30	0		0		73		39		112	
22:45	0		0		46	248	43	170	89	418
23:00	0		0		50		40		90	
23:15	0		0		36		30		66	
23:30	0		0		49		30		79	
23:45	0		0		28	163	22	122	50	285
TOTALS						10115		5874		15989
SPLIT %						63.3%		36.7%		57.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	14,499	13,138	27,637

AM Peak Hour			07:30	06:45	07:15
AM Pk Volume			789	1537	2164
Pk Hr Factor			0.939	0.958	0.984
7 - 9 Volume	0	0	1371	2662	4033
7 - 9 Peak Hour			07:30	07:00	07:15
7 - 9 Pk Volume	0	0	789	1508	2164
Pk Hr Factor	0.000	0.000	0.939	0.940	0.984

PM Peak Hour			16:30	14:00	16:30
PM Pk Volume			1621	801	2423
Pk Hr Factor			0.956	0.802	0.962
4 - 6 Volume	0	0	3236	1393	4629
4 - 6 Peak Hour			16:30	16:30	16:30
4 - 6 Pk Volume	0	0	1662	761	2423
Pk Hr Factor	0.000	0.000	0.980	0.897	0.962

Prepared by NDS/ATD

Project #: CA15_5207_039 **City:** Irwindale

Location: Live Oak Ave 250' w/o Baldwin Park Blvd **Dates:** 05/05/2015 & 05/06/2015 & 05/07/2015

3-DAY AVERAGE



Prepared by National Data & Surveying Services

CLASSIFICATION

Live Oak Ave 300' e/o Baldwin Park Blvd

Days: Tuesday & Wednesday & Thursday
Dates: 05/05/2015 & 05/06/2015 & 05/07/2015

City: Irwindale
Project #: CA15_5207_040

3-DAY AVERAGE

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	131	21	1	9	0	0	1	0	0	0	0	0	163
01:00	0	97	10	0	5	0	0	1	0	0	0	0	0	113
02:00	0	94	17	1	13	0	0	0	1	0	0	0	0	126
03:00	0	159	24	0	25	1	0	2	0	0	2	0	0	213
04:00	0	313	65	0	76	1	0	6	2	0	8	0	0	471
05:00	0	846	181	8	159	10	0	14	7	0	3	0	0	1228
06:00	1	1253	218	13	188	24	0	13	12	0	5	0	0	1727
07:00	2	1586	199	14	180	15	3	10	20	0	4	0	0	2033
08:00	4	1347	195	21	223	19	4	21	19	1	31	0	0	1885
09:00	0	903	158	23	186	21	6	20	21	1	18	0	1	1358
10:00	3	673	168	24	207	22	7	19	26	0	21	0	0	1170
11:00	0	738	155	32	211	16	5	23	17	0	22	0	1	1220
12:00 PM	2	915	144	32	197	19	6	20	21	0	17	0	0	1373
13:00	2	966	175	27	197	22	5	22	24	0	16	0	0	1456
14:00	4	1214	237	27	223	28	8	25	25	0	20	0	2	1813
15:00	2	1332	246	25	222	26	4	18	23	0	7	0	4	1909
16:00	3	1489	239	14	154	16	1	10	14	0	0	0	1	1941
17:00	4	1702	202	10	122	10	1	8	9	0	0	0	0	2068
18:00	0	1405	163	9	78	8	0	13	6	0	0	0	2	1684
19:00	0	882	102	10	51	0	0	8	5	0	0	0	0	1058
20:00	1	584	69	8	32	2	0	7	4	0	0	0	0	707
21:00	0	487	56	3	29	0	0	1	2	0	0	0	0	578
22:00	0	371	41	3	18	0	0	2	2	0	0	0	0	437
23:00	0	279	26	1	13	0	0	1	0	0	0	0	0	320
Totals	28	19766	3111	306	2818	260	50	265	260	2	174		11	27051
% of Totals	0%	73%	12%	1%	10%	1%	0%	1%	1%	0%	1%		0%	100%

AM Volumes	10	8140	1411	137	1482	129	25	130	125	2	114	0	2	11707
% AM	0%	30%	5%	1%	5%	0%	0%	0%	0%	0%	0%		0%	43%
AM Peak Hour	08:00	07:00	06:00	11:00	08:00	06:00	10:00	11:00	10:00	08:00	08:00		09:00	07:00
Volume	4	1586	218	32	223	24	7	23	26	1	31		1	2033
PM Volumes	18	11626	1700	169	1336	131	25	135	135	0	60	0	9	15344
% PM	0%	43%	6%	1%	5%	0%	0%	0%	0%		0%		0%	57%
PM Peak Hour	14:00	17:00	15:00	12:00	14:00	14:00	14:00	14:00	14:00		14:00		15:00	17:00
Volume	4	1702	246	32	223	28	8	25	25		20		4	2068

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	3918		14%	2829		10%	4009		15%	16295		60%

Classification Definitions

1 Motorcycles	**4** Buses	**7** > =4-Axle Single Units	**10** >=6-Axle Single Trailers	**13** >=7-Axle Multi-Trailers
2 Passenger Cars	**5** 2-Axle, 6-Tire Single Units	**8** <=4-Axle Single Trailers	**11** <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	**6** 3-Axle Single Units	**9** 5-Axle Single Trailers	**12** 6-Axle Multi-Trailers	

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Live Oak Ave 300' e/o Baldwin Park Blvd

Days: Tuesday & Wednesday & Thursday
Dates: 05/05/2015 & 05/06/2015 & 05/07/2015

3-DAY AVERAGE

City: Irwindale
Project #: CA15_5207_040

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,501	13,550	27,051

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	26		30		56		12:00	0	0	179		164		343	
00:15	0	0	26		25		51		12:15	0	0	172		155		327	
00:30	0	0	15		14		29		12:30	0	0	185		166		351	
00:45	0	0	15	82	12	81	27	163	12:45	0	0	185	721	167	652	352	1373
01:00	0	0	15		29		44		13:00	0	0	175		186		361	
01:15	0	0	7		13		20		13:15	0	0	171		173		344	
01:30	0	0	13		14		27		13:30	0	0	171		191		362	
01:45	0	0	9	44	13	69	22	113	13:45	0	0	195	712	194	744	389	1456
02:00	0	0	12		12		24		14:00	0	0	222		183		405	
02:15	0	0	9		15		24		14:15	0	0	225		187		412	
02:30	0	0	17		17		34		14:30	0	0	263		263		526	
02:45	0	0	20	58	24	68	44	126	14:45	0	0	247	957	223	856	470	1813
03:00	0	0	18		19		37		15:00	0	0	248		190		438	
03:15	0	0	23		24		47		15:15	0	0	290		187		477	
03:30	0	0	23		33		56		15:30	0	0	290		222		512	
03:45	0	0	30	94	43	119	73	213	15:45	0	0	281	1109	201	800	482	1909
04:00	0	0	21		43		64		16:00	0	0	279		190		469	
04:15	0	0	37		54		91		16:15	0	0	290		181		471	
04:30	0	0	65		81		146		16:30	0	0	291		245		536	
04:45	0	0	90	213	80	258	170	471	16:45	0	0	290	1150	175	791	465	1941
05:00	0	0	78		123		201		17:00	0	0	297		241		538	
05:15	0	0	103		156		259		17:15	0	0	281		239		520	
05:30	0	0	143		201		344		17:30	0	0	316		209		525	
05:45	0	0	189	513	235	715	424	1228	17:45	0	0	306	1200	179	868	485	2068
06:00	0	0	105		234		339		18:00	0	0	300		173		473	
06:15	0	0	129		285		414		18:15	0	0	278		145		423	
06:30	0	0	159		337		496		18:30	0	0	280		138		418	
06:45	0	0	173	566	305	1161	478	1727	18:45	0	0	246	1104	124	580	370	1684
07:00	0	0	139		335		474		19:00	0	0	220		128		348	
07:15	0	0	164		345		509		19:15	0	0	164		89		253	
07:30	0	0	185		324		509		19:30	0	0	129		101		230	
07:45	0	0	228	716	313	1317	541	2033	19:45	0	0	131	644	96	414	227	1058
08:00	0	0	226		292		518		20:00	0	0	110		87		197	
08:15	0	0	212		292		504		20:15	0	0	95		82		177	
08:30	0	0	176		276		452		20:30	0	0	87		83		170	
08:45	0	0	168	782	243	1103	411	1885	20:45	0	0	88	380	75	327	163	707
09:00	0	0	149		210		359		21:00	0	0	81		76		157	
09:15	0	0	147		191		338		21:15	0	0	69		71		140	
09:30	0	0	153		173		326		21:30	0	0	70		71		141	
09:45	0	0	144	593	191	765	335	1358	21:45	0	0	66	286	74	292	140	578
10:00	0	0	144		147		291		22:00	0	0	67		56		123	
10:15	0	0	136		149		285		22:15	0	0	52		53		105	
10:30	0	0	152		165		317		22:30	0	0	63		55		118	
10:45	0	0	139	571	138	599	277	1170	22:45	0	0	43	225	48	212	91	437
11:00	0	0	146		152		298		23:00	0	0	46		52		98	
11:15	0	0	142		143		285		23:15	0	0	40		34		74	
11:30	0	0	156		148		304		23:30	0	0	44		44		88	
11:45	0	0	175	619	158	601	333	1220	23:45	0	0	32	162	28	158	60	320
TOTALS				4851		6856		11707	TOTALS				8650		6694		15344
SPLIT %				41.4%		58.6%		43.3%	SPLIT %				56.4%		43.6%		56.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,501	13,550	27,051

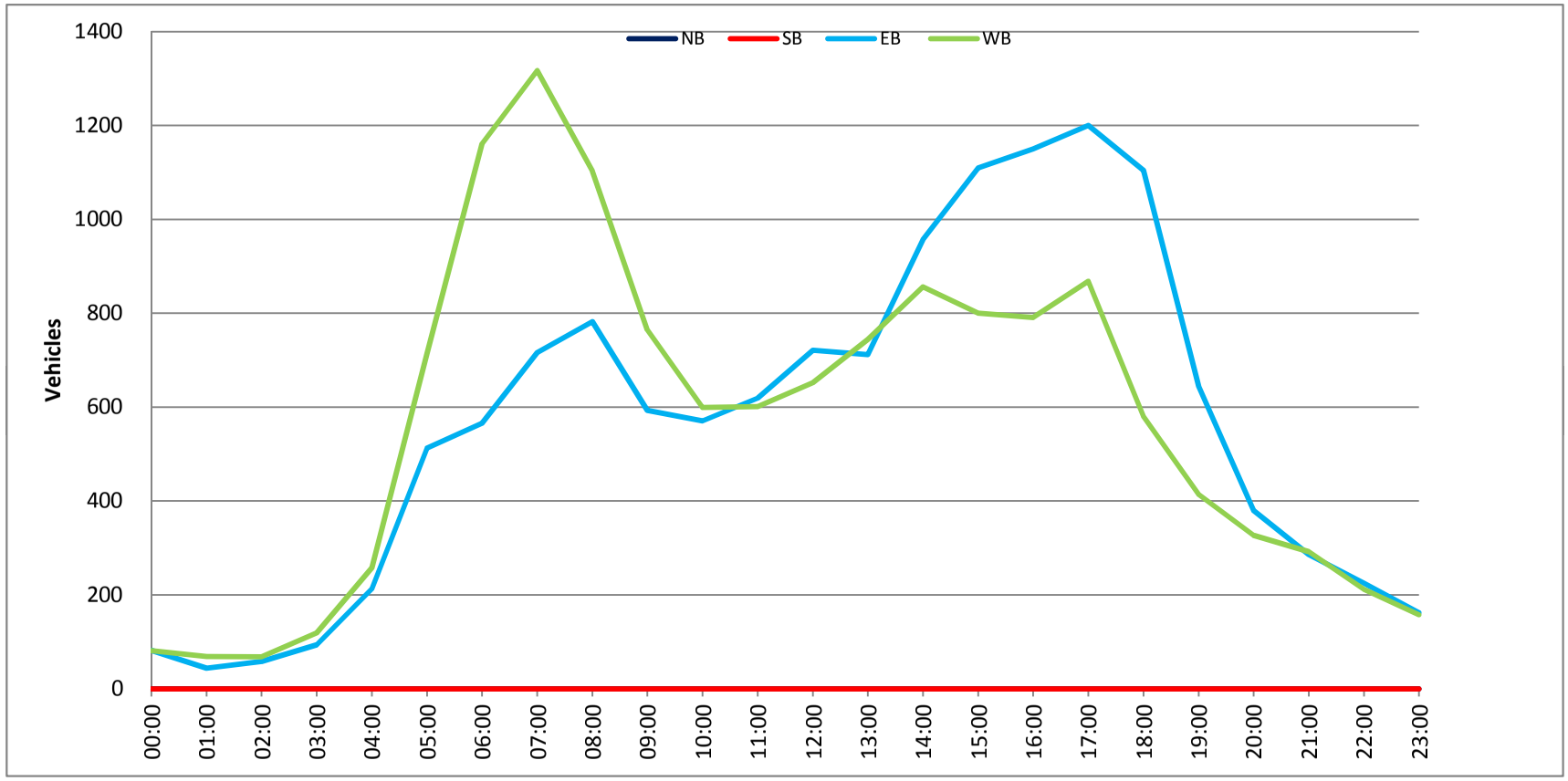
AM Peak Hour			07:30	06:30	07:15	PM Peak Hour			17:15	16:30	17:00
AM Pk Volume			851	1322	2077	PM Pk Volume			1164	900	2068
Pk Hr Factor			0.933	0.958	0.960	Pk Hr Factor			0.951	0.900	0.961
7 - 9 Volume	0	0	1498	2420	3918	4 - 6 Volume	0	0	2350	1659	4009
7 - 9 Peak Hour			07:30	07:00	07:15	4 - 6 Peak Hour			17:00	16:30	17:00
7 - 9 Pk Volume	0	0	851	1317	2077	4 - 6 Pk Volume	0	0	1200	900	2068
Pk Hr Factor	0.000	0.000	0.933	0.954	0.960	Pk Hr Factor	0.000	0.000	0.949	0.918	0.961

Prepared by NDS/ATD

Project #: CA15_5207_040 **City:** Irwindale

Location: Live Oak Ave 300' e/o Baldwin Park Blvd **Dates:** 05/05/2015 & 05/06/2015 & 05/07/2015

3-DAY AVERAGE



Prepared by National Data & Surveying Services

CLASSIFICATION

Rivergrade Rd 200' w/o Arrow Hwy

Days: Tuesday & Wednesday & Thursday
Dates: 05/19/2015 & 05/20/2015 & 05/21/2015

City: Irwindale
Project #: CA15_5207_043

3-DAY AVERAGE

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	22	1	0	4	0	0	0	1	0	0	0	0	28
01:00	0	23	3	0	3	0	0	0	0	0	0	0	0	29
02:00	0	15	1	1	3	0	0	0	5	0	0	0	0	25
03:00	0	21	2	0	6	0	0	1	2	0	0	0	0	32
04:00	0	40	13	0	5	2	0	3	5	0	0	0	0	68
05:00	0	114	12	2	17	7	0	1	9	0	0	0	0	162
06:00	0	164	25	8	21	12	1	6	10	0	1	0	0	248
07:00	0	278	40	7	38	5	0	6	10	0	4	0	0	388
08:00	0	294	38	6	39	4	3	7	6	1	8	0	0	406
09:00	0	181	26	7	49	8	0	4	10	0	10	0	0	295
10:00	1	125	22	7	50	2	2	6	14	0	15	0	0	244
11:00	0	156	30	8	47	7	1	6	9	0	9	0	0	273
12:00 PM	1	192	30	11	47	4	0	4	6	0	13	0	0	308
13:00	0	195	30	11	49	5	1	6	9	0	11	0	0	317
14:00	0	196	27	9	36	4	0	9	6	0	6	0	0	293
15:00	1	183	34	6	25	6	0	4	2	0	2	0	0	263
16:00	0	258	36	6	20	10	0	6	1	0	0	0	0	337
17:00	0	284	35	2	16	6	0	5	2	0	0	0	0	350
18:00	0	148	18	5	7	2	0	1	0	0	0	0	0	181
19:00	0	112	12	2	6	0	0	1	1	0	0	0	0	134
20:00	0	87	9	2	7	0	0	0	1	0	0	0	0	106
21:00	0	77	5	1	4	0	0	1	1	0	0	0	0	89
22:00	0	67	5	0	6	0	0	1	3	0	0	0	0	82
23:00	0	39	3	0	4	0	0	1	0	0	0	0	0	47
Totals	3	3271	457	101	509	84	8	79	113	1	79			4705
% of Totals	0%	70%	10%	2%	11%	2%	0%	2%	2%	0%	2%			100%

AM Volumes	1	1433	213	46	282	47	7	40	81	1	47	0	0	2198
% AM	0%	30%	5%	1%	6%	1%	0%	1%	2%	0%	1%			47%
AM Peak Hour	10:00	08:00	07:00	06:00	10:00	06:00	08:00	08:00	10:00	08:00	10:00			08:00
Volume	1	294	40	8	50	12	3	7	14	1	15			406
PM Volumes	2	1838	244	55	227	37	1	39	32	0	32	0	0	2507
% PM	0%	39%	5%	1%	5%	1%	0%	1%	1%		1%			53%
PM Peak Hour	12:00	17:00	16:00	12:00	13:00	16:00	13:00	14:00	13:00		12:00			17:00
Volume	1	284	36	11	49	10	1	9	9		13			350

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	794		17%	625		13%	687		15%	2599		55%

Classification Definitions

1 Motorcycles	**4** Buses	**7** > =4-Axle Single Units	**10** >=6-Axle Single Trailers	**13** >=7-Axle Multi-Trailers
2 Passenger Cars	**5** 2-Axle, 6-Tire Single Units	**8** <=4-Axle Single Trailers	**11** <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	**6** 3-Axle Single Units	**9** 5-Axle Single Trailers	**12** 6-Axle Multi-Trailers	

Prepared by National Data & Surveying Services

VOLUME

Rivergrade Rd 200' w/o Arrow Hwy

Days: Tuesday & Wednesday & Thursday
Dates: 05/19/2015 & 05/20/2015 & 05/21/2015

3-DAY AVERAGE

City: Irwindale
Project #: CA15_5207_043

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,183	2,522	4,705

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	4		5		9		12:00	0	0	44		43		87	
00:15	0	0	5		3		8		12:15	0	0	30		34		64	
00:30	0	0	1		3		4		12:30	0	0	35		43		78	
00:45	0	0	4	14	3	14	7	28	12:45	0	0	31	140	48	168	79	308
01:00	0	0	5		3		8		13:00	0	0	41		51		92	
01:15	0	0	5		2		7		13:15	0	0	29		48		77	
01:30	0	0	2		3		5		13:30	0	0	31		39		70	
01:45	0	0	4	16	5	13	9	29	13:45	0	0	31	132	47	185	78	317
02:00	0	0	5		2		7		14:00	0	0	30		36		66	
02:15	0	0	4		3		7		14:15	0	0	25		40		65	
02:30	0	0	5		1		6		14:30	0	0	45		42		87	
02:45	0	0	4	18	1	7	5	25	14:45	0	0	31	131	44	162	75	293
03:00	0	0	3		4		7		15:00	0	0	33		33		66	
03:15	0	0	5		2		7		15:15	0	0	31		34		65	
03:30	0	0	5		2		7		15:30	0	0	35		38		73	
03:45	0	0	8	21	3	11	11	32	15:45	0	0	30	129	29	134	59	263
04:00	0	0	3		5		8		16:00	0	0	38		36		74	
04:15	0	0	5		7		12		16:15	0	0	35		44		79	
04:30	0	0	11		9		20		16:30	0	0	48		48		96	
04:45	0	0	12	31	16	37	28	68	16:45	0	0	38	159	50	178	88	337
05:00	0	0	18		15		33		17:00	0	0	56		47		103	
05:15	0	0	16		13		29		17:15	0	0	44		43		87	
05:30	0	0	17		20		37		17:30	0	0	50		46		96	
05:45	0	0	28	79	35	83	63	162	17:45	0	0	32	182	32	168	64	350
06:00	0	0	31		16		47		18:00	0	0	29		28		57	
06:15	0	0	27		20		47		18:15	0	0	24		24		48	
06:30	0	0	42		26		68		18:30	0	0	20		18		38	
06:45	0	0	41	141	45	107	86	248	18:45	0	0	20	93	18	88	38	181
07:00	0	0	40		43		83		19:00	0	0	22		18		40	
07:15	0	0	38		44		82		19:15	0	0	15		18		33	
07:30	0	0	37		57		94		19:30	0	0	14		16		30	
07:45	0	0	54	169	75	219	129	388	19:45	0	0	15	66	16	68	31	134
08:00	0	0	38		70		108		20:00	0	0	15		14		29	
08:15	0	0	26		73		99		20:15	0	0	11		15		26	
08:30	0	0	36		72		108		20:30	0	0	15		11		26	
08:45	0	0	24	124	67	282	91	406	20:45	0	0	13	54	12	52	25	106
09:00	0	0	26		52		78		21:00	0	0	14		11		25	
09:15	0	0	26		42		68		21:15	0	0	13		11		24	
09:30	0	0	34		44		78		21:30	0	0	8		13		21	
09:45	0	0	32	118	39	177	71	295	21:45	0	0	7	42	12	47	19	89
10:00	0	0	27		24		51		22:00	0	0	11		14		25	
10:15	0	0	30		35		65		22:15	0	0	8		12		20	
10:30	0	0	29		36		65		22:30	0	0	8		12		20	
10:45	0	0	31	117	32	127	63	244	22:45	0	0	6	33	11	49	17	82
11:00	0	0	26		29		55		23:00	0	0	7		4		11	
11:15	0	0	35		26		61		23:15	0	0	3		10		13	
11:30	0	0	45		33		78		23:30	0	0	9		6		15	
11:45	0	0	45	151	34	122	79	273	23:45	0	0	4	23	4	24	8	47
TOTALS				999		1199		2198	TOTALS				1184		1323		2507
SPLIT %				45.5%		54.5%		46.7%	SPLIT %				47.2%		52.8%		53.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,183	2,522	4,705

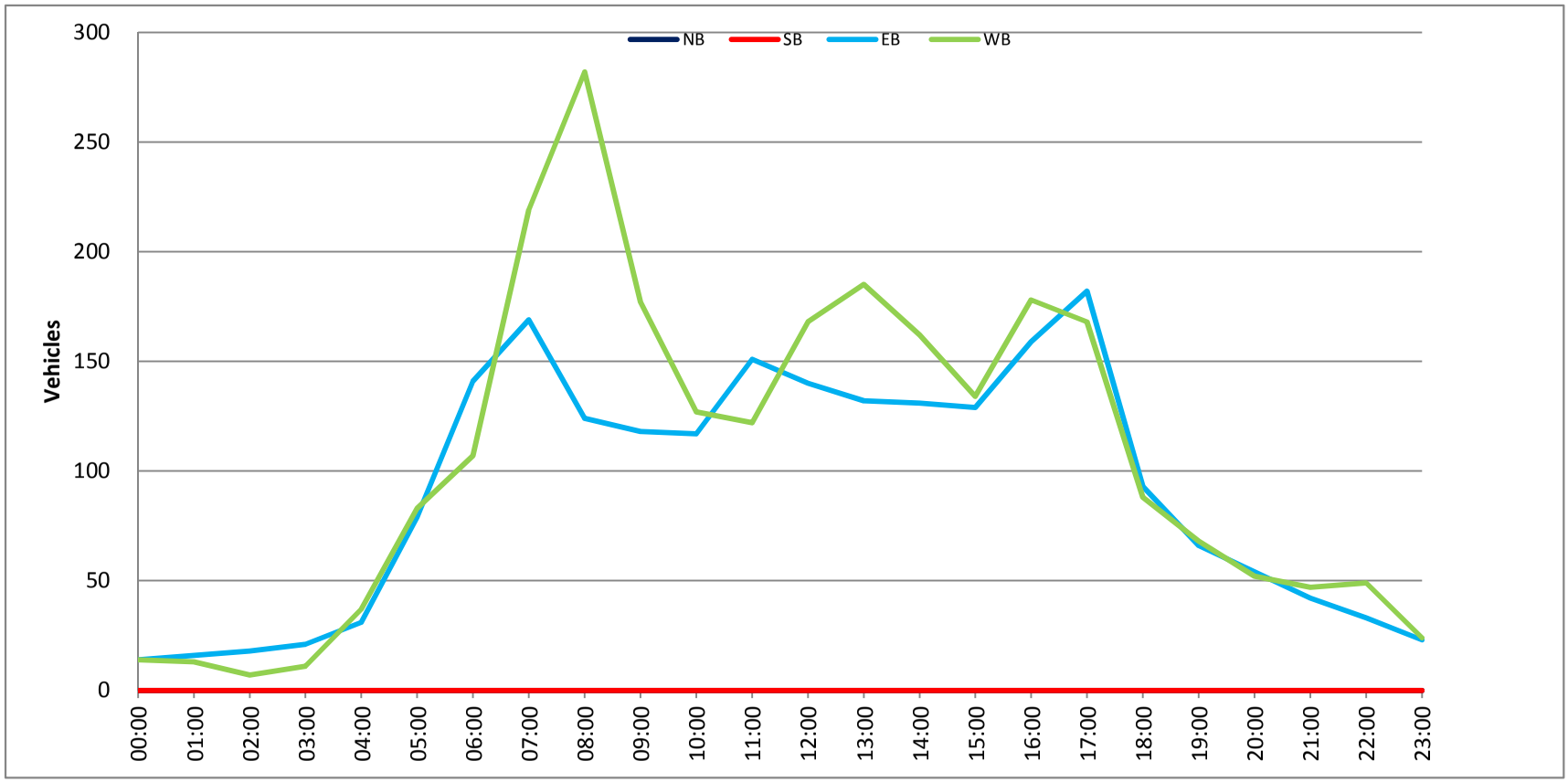
AM Peak Hour			07:00	07:45	07:45	PM Peak Hour			16:45	12:30	16:30
AM Pk Volume			169	290	444	PM Pk Volume			155	190	374
Pk Hr Factor			0.782	0.967	0.860	Pk Hr Factor			0.775	0.907	0.908
7 - 9 Volume	0	0	293	501	794	4 - 6 Volume	0	0	341	346	687
7 - 9 Peak Hour			07:00	07:45	07:45	4 - 6 Peak Hour			16:45	16:15	16:30
7 - 9 Pk Volume	0	0	169	290	444	4 - 6 Pk Volume	0	0	188	189	374
Pk Hr Factor	0.000	0.000	0.782	0.967	0.860	Pk Hr Factor	0.000	0.000	0.839	0.945	0.908

Prepared by NDS/ATD

Project #: CA15_5207_043 **City:** Irwindale

Location: Rivergrade Rd 200' w/o Arrow Hwy **Dates:** 05/19/2015 & 05/20/2015 & 05/21/2015

3-DAY AVERAGE



Prepared by National Data & Surveying Services

CLASSIFICATION

Stewart Ave Bet. Rivergrade Rd & Live Oak Ave (Midblock)

Days: Tuesday & Wednesday & Thursday
Dates: 06/09/2015 & 06/10/2015 & 06/11/2015

City: Irwindale
Project #: CA15_5207_044

3-DAY AVERAGE

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	18	0	0	0	0	0	0	0	0	0	0	0	18
01:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
02:00	0	11	1	0	0	0	0	0	1	0	0	0	0	13
03:00	1	14	2	0	0	0	0	0	0	0	0	0	0	17
04:00	0	26	8	0	0	3	0	0	0	0	0	0	0	37
05:00	0	90	8	0	4	2	0	0	0	0	0	0	0	104
06:00	0	101	16	0	3	3	0	1	0	0	0	0	0	124
07:00	1	180	19	0	5	1	0	3	1	0	0	0	0	210
08:00	0	139	17	0	7	0	0	0	2	0	0	0	0	165
09:00	0	83	12	0	6	0	0	1	2	0	0	0	0	104
10:00	0	70	12	1	8	0	0	2	1	0	0	0	0	94
11:00	0	101	13	3	5	0	0	2	3	0	0	0	0	127
12:00 PM	0	107	15	1	2	0	0	1	2	0	0	0	0	128
13:00	0	104	12	0	1	1	0	1	0	0	0	0	0	119
14:00	0	144	18	1	6	1	0	0	2	0	0	0	0	172
15:00	0	130	17	3	7	2	0	0	1	0	0	0	0	160
16:00	0	161	25	0	9	5	0	3	1	0	0	0	0	204
17:00	1	171	25	0	6	2	0	1	1	0	0	0	0	207
18:00	0	106	13	0	2	0	0	0	0	0	0	0	0	121
19:00	0	87	11	0	1	0	0	0	0	0	0	0	0	99
20:00	0	65	2	0	0	0	0	0	0	0	0	0	0	67
21:00	0	52	4	0	0	0	0	0	0	0	0	0	0	56
22:00	0	59	4	0	0	0	0	0	0	0	0	0	0	63
23:00	0	43	6	0	0	0	0	0	0	0	0	0	0	49
Totals	3	2072	261	9	72	20		15	17					2469
% of Totals	0%	84%	11%	0%	3%	1%		1%	1%					100%

AM Volumes	2	843	109	4	38	9	0	9	10	0	0	0	0	1024
% AM	0%	34%	4%	0%	2%	0%		0%	0%					41%
AM Peak Hour	07:00	07:00	07:00	11:00	10:00	04:00		07:00	11:00					07:00
Volume	1	180	19	3	8	3		3	3					210
PM Volumes	1	1229	152	5	34	11	0	6	7	0	0	0	0	1445
% PM	0%	50%	6%	0%	1%	0%		0%	0%					59%
PM Peak Hour	17:00	17:00	16:00	15:00	16:00	16:00		16:00	12:00					17:00
Volume	1	171	25	3	9	5		3	2					207

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	375		15%	247		10%	411		17%	1436		58%

Classification Definitions

1 Motorcycles	**4** Buses	**7** > =4-Axle Single Units	**10** >=6-Axle Single Trailers	**13** >=7-Axle Multi-Trailers
2 Passenger Cars	**5** 2-Axle, 6-Tire Single Units	**8** <=4-Axle Single Trailers	**11** <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	**6** 3-Axle Single Units	**9** 5-Axle Single Trailers	**12** 6-Axle Multi-Trailers	

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Stewart Ave Bet. Rivergrade Rd & Live Oak Ave (Midblock)

Days: Tuesday & Wednesday & Thursday
Dates: 06/09/2015 & 06/10/2015 & 06/11/2015

3-DAY AVERAGE

City: Irwindale
Project #: CA15_5207_044

DAILY TOTALS	NB	SB	EB	WB	Total
	1,051	1,418	0	0	2,469

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	3		6		0	0	9		12:00	15		20		0	0	35	
00:15	0		3		0	0	3		12:15	12		17		0	0	29	
00:30	2		2		0	0	4		12:30	16		19		0	0	35	
00:45	1	6	1	12	0	0	2	18	12:45	9	52	20	76	0	0	29	128
01:00	2		2		0	0	4		13:00	16		22		0	0	38	
01:15	1		2		0	0	3		13:15	11		15		0	0	26	
01:30	1		2		0	0	3		13:30	8		16		0	0	24	
01:45	1	5	0	6	0	0	1	11	13:45	12	47	19	72	0	0	31	119
02:00	1		2		0	0	3		14:00	19		15		0	0	34	
02:15	4		1		0	0	5		14:15	13		18		0	0	31	
02:30	1		1		0	0	2		14:30	19		45		0	0	64	
02:45	1	7	2	6	0	0	3	13	14:45	20	71	23	101	0	0	43	172
03:00	1		4		0	0	5		15:00	13		22		0	0	35	
03:15	1		2		0	0	3		15:15	14		24		0	0	38	
03:30	2		1		0	0	3		15:30	14		40		0	0	54	
03:45	2	6	4	11	0	0	6	17	15:45	7	48	26	112	0	0	33	160
04:00	3		4		0	0	7		16:00	11		42		0	0	53	
04:15	2		4		0	0	6		16:15	16		32		0	0	48	
04:30	5		4		0	0	9		16:30	18		39		0	0	57	
04:45	10	20	5	17	0	0	15	37	16:45	11	56	35	148	0	0	46	204
05:00	14		2		0	0	16		17:00	19		46		0	0	65	
05:15	11		4		0	0	15		17:15	14		36		0	0	50	
05:30	17		9		0	0	26		17:30	20		30		0	0	50	
05:45	27	69	20	35	0	0	47	104	17:45	14	67	28	140	0	0	42	207
06:00	15		9		0	0	24		18:00	9		25		0	0	34	
06:15	20		6		0	0	26		18:15	12		17		0	0	29	
06:30	21		6		0	0	27		18:30	8		19		0	0	27	
06:45	28	84	19	40	0	0	47	124	18:45	14	43	17	78	0	0	31	121
07:00	29		24		0	0	53		19:00	10		15		0	0	25	
07:15	34		19		0	0	53		19:15	8		18		0	0	26	
07:30	29		21		0	0	50		19:30	10		16		0	0	26	
07:45	33	125	21	85	0	0	54	210	19:45	9	37	13	62	0	0	22	99
08:00	23		31		0	0	54		20:00	5		13		0	0	18	
08:15	13		27		0	0	40		20:15	10		8		0	0	18	
08:30	17		23		0	0	40		20:30	4		12		0	0	16	
08:45	10	63	21	102	0	0	31	165	20:45	6	25	9	42	0	0	15	67
09:00	12		18		0	0	30		21:00	6		8		0	0	14	
09:15	10		12		0	0	22		21:15	6		10		0	0	16	
09:30	14		12		0	0	26		21:30	3		9		0	0	12	
09:45	14	50	12	54	0	0	26	104	21:45	7	22	7	34	0	0	14	56
10:00	12		13		0	0	25		22:00	7		13		0	0	20	
10:15	13		9		0	0	22		22:15	4		11		0	0	15	
10:30	10		10		0	0	20		22:30	4		9		0	0	13	
10:45	14	49	13	45	0	0	27	94	22:45	7	22	8	41	0	0	15	63
11:00	16		17		0	0	33		23:00	9		10		0	0	19	
11:15	12		13		0	0	25		23:15	2		6		0	0	8	
11:30	15		17		0	0	32		23:30	1		11		0	0	12	
11:45	21	64	16	63	0	0	37	127	23:45	1	13	9	36	0	0	10	49
TOTALS		548		476				1024	TOTALS		503		942				1445
SPLIT %		53.5%		46.5%				41.5%	SPLIT %		34.8%		65.2%				58.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,051	1,418	0	0	2,469

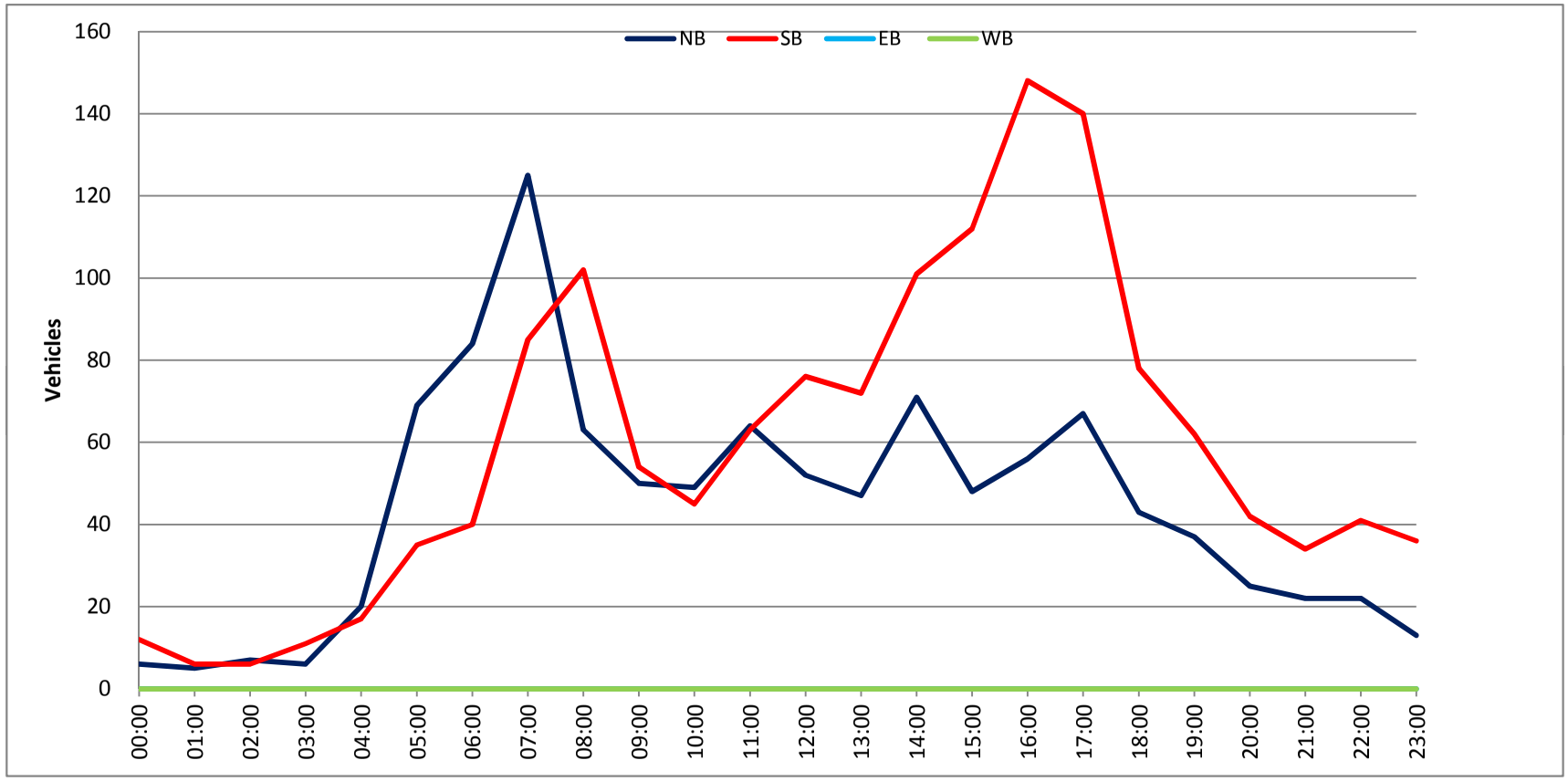
AM Peak Hour	07:00	07:45				07:15	PM Peak Hour	14:00	16:30				16:30
AM Pk Volume	125	102				211	PM Pk Volume	71	156				218
Pk Hr Factor	0.919	0.823				0.977	Pk Hr Factor	0.825	0.761				0.838
7 - 9 Volume	188	187	0	0		375	4 - 6 Volume	123	288	0	0		411
7 - 9 Peak Hour	07:00	07:45				07:15	4 - 6 Peak Hour	17:00	16:30				16:30
7 - 9 Pk Volume	125	102	0	0		211	4 - 6 Pk Volume	67	156	0	0		218
Pk Hr Factor	0.919	0.823	0.000	0.000		0.977	Pk Hr Factor	0.838	0.848	0.000	0.000		0.838

Prepared by NDS/ATD

Project #: CA15_5207_044 **City:** Irwindale

Location: Stewart Ave Bet. Rivergrade Rd & Live Oak **Dates:** 06/09/2015 & 06/10/2015 & 06/11/2015

3-DAY AVERAGE



APPENDIX C:

PEAK HOUR TRAFFIC COUNT DATA AND VOLUME DEVELOPMENT SUMMARY

ITM Peak Hour Summary

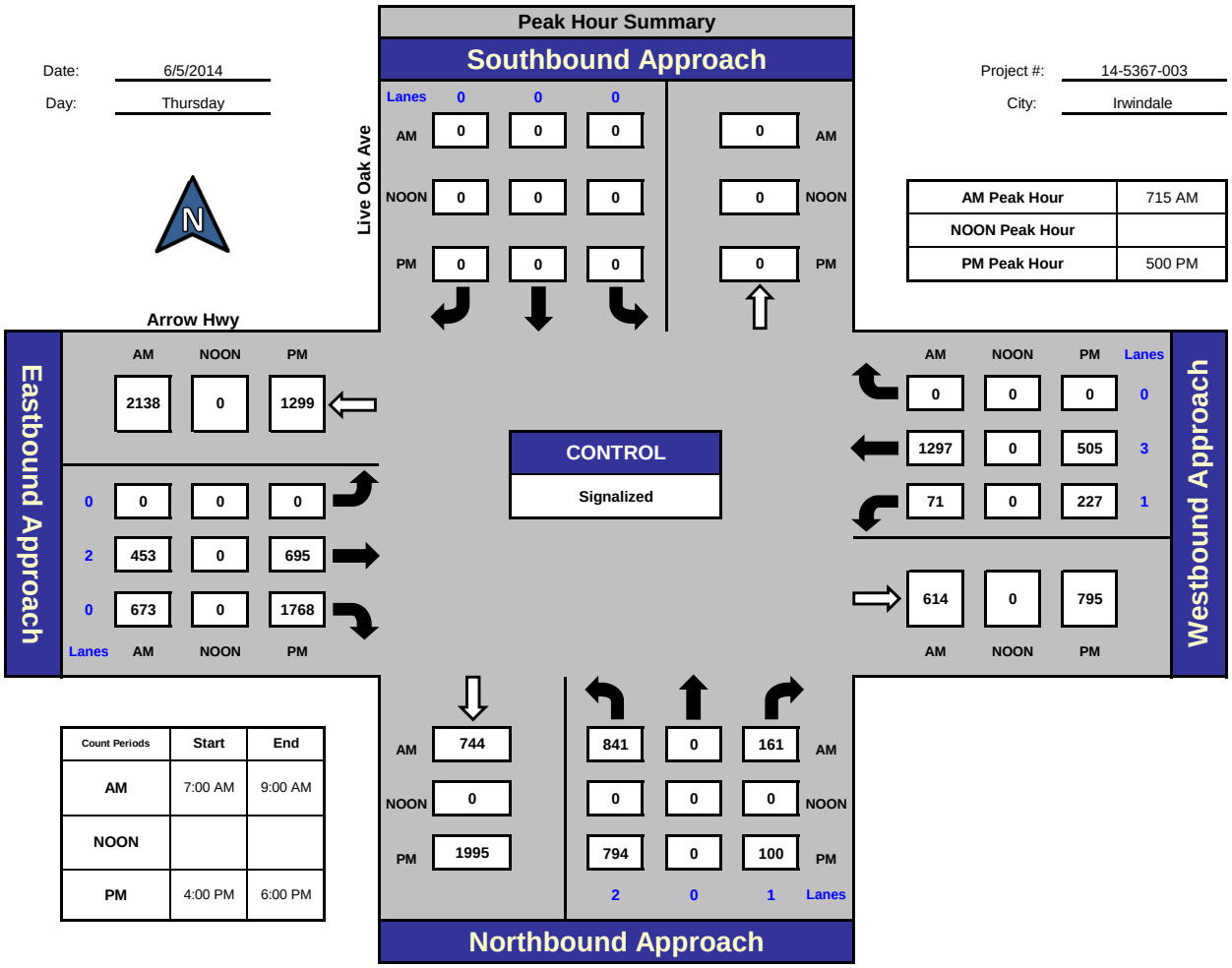
Prepared by:

National Data & Surveying Services

Live Oak Ave and Arrow Hwy , Irwindale

Date: 6/5/2014
Day: Thursday

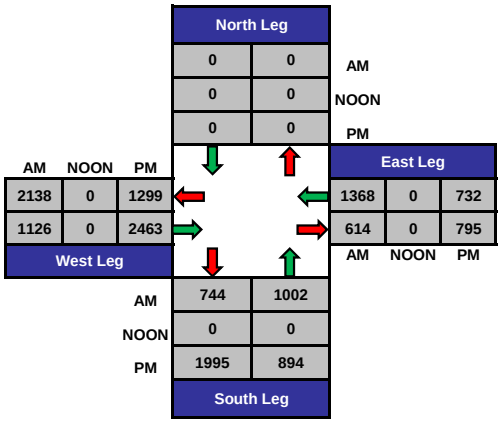
Project #: 14-5367-003
City: Irwindale



AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg

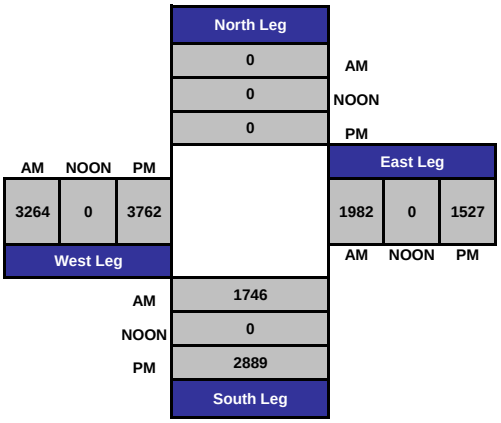


Table C-1 - Existing Peak Hour Volumes

(Intersections With Classification Counts)

	AM Peak Hour						PM Peak Hour					
	Passenger Vehicles	Trucks				Total PCE Volume	Passenger Vehicles	Trucks				Total PCE Volume
		2 Axle	3 Axle	4 Axle	PCE			2 Axle	3 Axle	4 Axle	PCE	
4 Arrow Highway/Live Oak Avenue												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	421	11	11	10	69	490	684	4	2	5	25	709
NBR	629	10	14	20	103	732	1,704	39	19	6	115	1,819
SBL	36	5	14	16	84	120	220	2	1	4	17	237
SBT	1,269	13	3	12	62	1,331	495	6	0	4	21	516
SBR	0	0	0	0	0	0	0	0	0	0	0	0
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	0	0	0	0	0	0	0	0	0	0	0	0
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	792	10	12	27	120	912	772	9	4	9	49	821
WBT	0	0	0	0	0	0	0	0	0	0	0	0
WBR	139	3	4	15	58	197	88	4	1	7	29	117
North Leg												
Approach	1,305	18	17	28	146	1,451	715	8	1	8	38	753
Departure	560	14	15	25	127	687	772	8	3	12	54	826
Total	1,865	32	32	53	273	2,138	1,487	16	4	20	92	1,579
South Leg												
Approach	1,050	21	25	30	172	1,222	2,388	43	21	11	140	2,528
Departure	2,061	23	15	39	182	2,243	1,267	15	4	13	70	1,337
Total	3,111	44	40	69	354	3,465	3,655	58	25	24	210	3,865
East Leg												
Approach	931	13	16	42	178	1,109	860	13	5	16	78	938
Departure	665	15	28	36	187	852	1,924	41	20	10	132	2,056
Total	1,596	28	44	78	365	1,961	2,784	54	25	26	210	2,994
West Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Total Approaches												
Approach	3,286	52	58	100	496	3,782	3,963	64	27	35	256	4,219
Departure	3,286	52	58	100	496	3,782	3,963	64	27	35	256	4,219
Total	6,572	104	116	200	992	7,564	7,926	128	54	70	512	8,438

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Avenida Barbosa and Arrow Hwy , Irwindale

Date: 6/5/2014

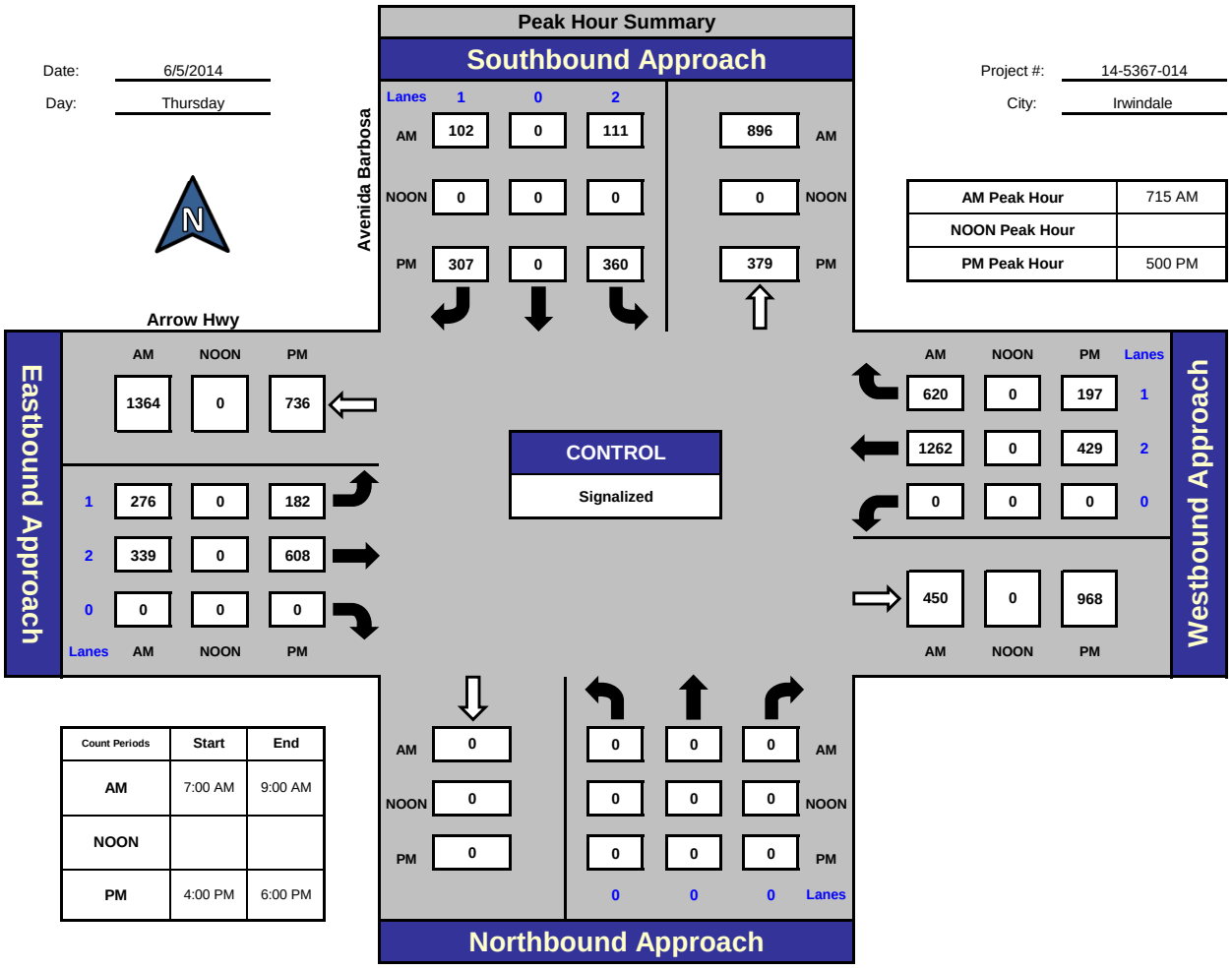
Day: Thursday

Project #: 14-5367-014

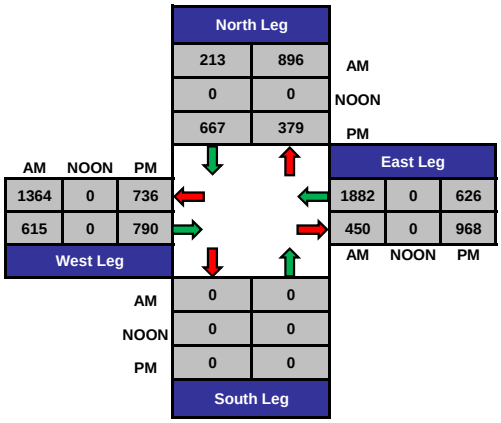
City: Irwindale

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM



Total Ins & Outs



Total Volume Per Leg

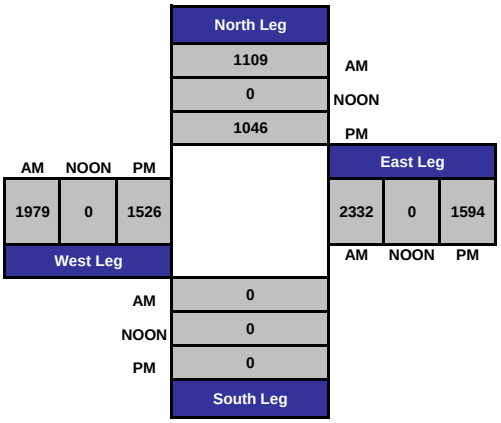


Table C-1 - Existing Peak Hour Volumes

(Intersections With Classification Counts)

	AM Peak Hour						PM Peak Hour					
	Passenger Vehicles	Trucks				Total PCE Volume	Passenger Vehicles	Trucks				Total PCE Volume
		2 Axle	3 Axle	4 Axle	PCE			2 Axle	3 Axle	4 Axle	PCE	
19 Avenida Barbosa/Arrow Highway												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	0	0	0	0	0	0	0	0	0	0	0	0
SBL	103	5	0	3	17	120	358	2	0	0	3	361
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	86	5	5	6	36	122	305	1	0	1	5	310
EBL	268	3	3	3	20	288	180	5	0	0	8	188
EBT	300	10	12	17	90	390	590	4	2	12	46	636
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	0	0	0	0	0	0	0	0	0	0	0	0
WBT	1,215	11	14	22	111	1,326	413	8	1	7	35	448
WBR	603	6	2	9	40	643	195	2	0	0	3	198
North Leg												
Approach	189	10	5	9	53	242	663	3	0	1	8	671
Departure	871	9	5	12	60	931	375	7	0	0	11	386
Total	1,060	19	10	21	113	1,173	1,038	10	0	1	19	1,057
South Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
East Leg												
Approach	1,818	17	16	31	151	1,969	608	10	1	7	38	646
Departure	403	15	12	20	107	510	948	6	2	12	49	997
Total	2,221	32	28	51	258	2,479	1,556	16	3	19	87	1,643
West Leg												
Approach	568	13	15	20	110	678	770	9	2	12	54	824
Departure	1,301	16	19	28	147	1,448	718	9	1	8	40	758
Total	1,869	29	34	48	257	2,126	1,488	18	3	20	94	1,582
Total Approaches												
Approach	2,575	40	36	60	314	2,889	2,041	22	3	20	100	2,141
Departure	2,575	40	36	60	314	2,889	2,041	22	3	20	100	2,141
Total	5,150	80	72	120	628	5,778	4,082	44	6	40	200	4,282

ITM Peak Hour Summary

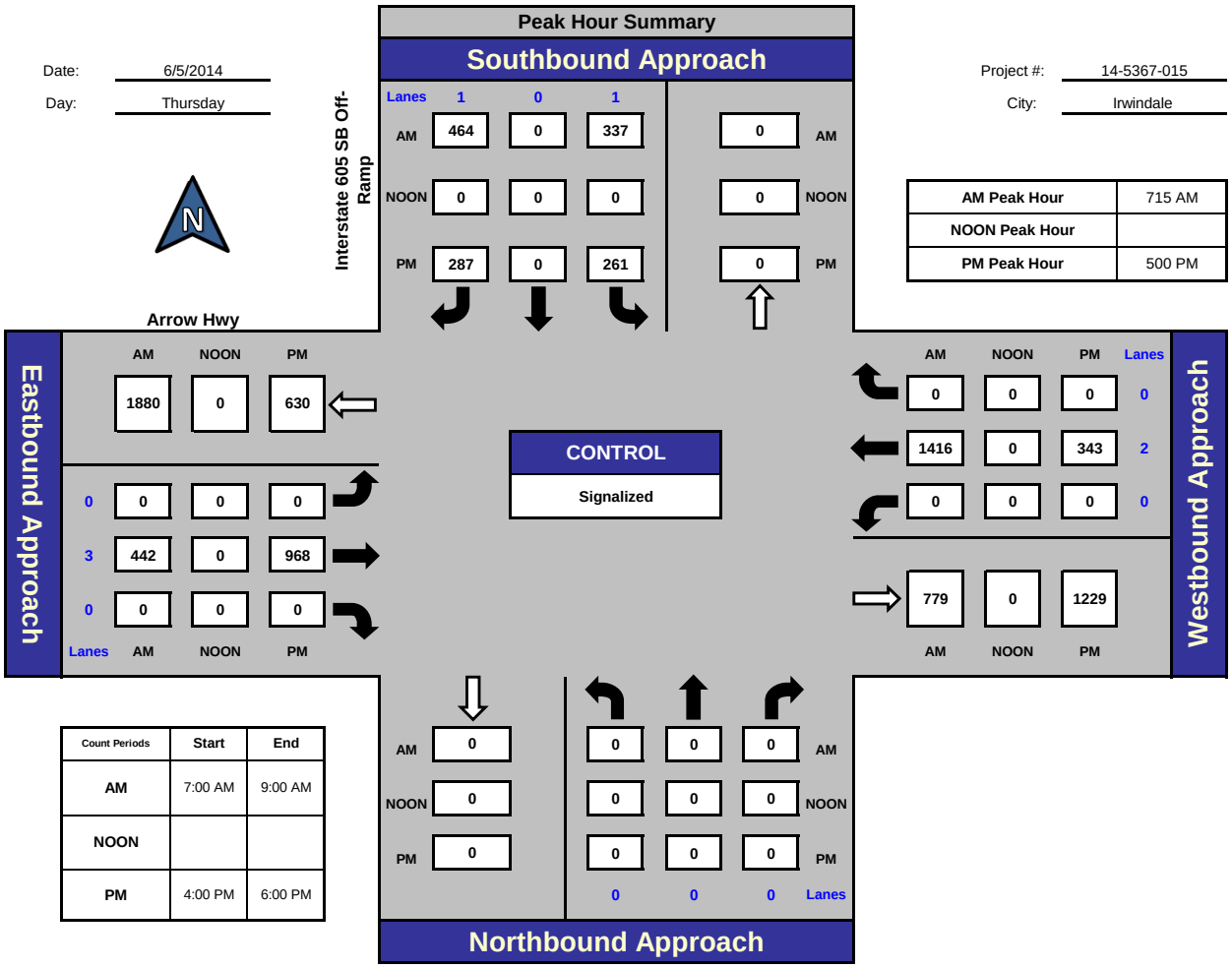
Prepared by:

National Data & Surveying Services

Interstate 605 SB Off-Ramp and Arrow Hwy , Irwindale

Date: 6/5/2014
Day: Thursday

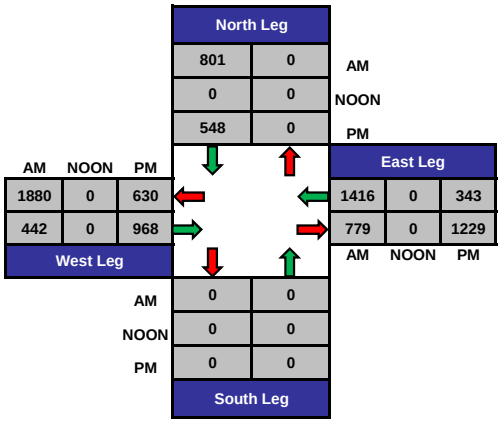
Project #: 14-5367-015
City: Irwindale



AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg

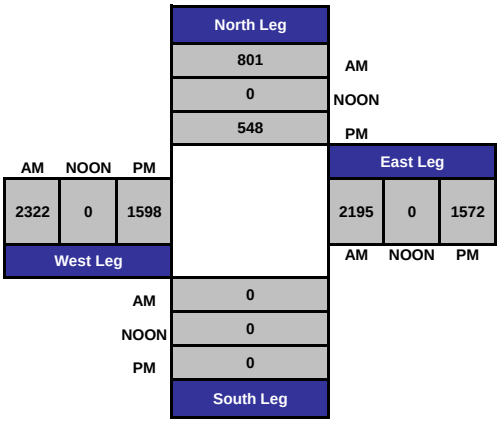


Table C-1 - Existing Peak Hour Volumes

(Intersections With Classification Counts)

	AM Peak Hour						PM Peak Hour					
	Passenger Vehicles	Trucks				Total PCE Volume	Passenger Vehicles	Trucks				Total PCE Volume
		2 Axle	3 Axle	4 Axle	PCE			2 Axle	3 Axle	4 Axle	PCE	
20 Interstate 605 Southbound Off-Ramp/Arrow Highway												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	0	0	0	0	0	0	0	0	0	0	0	0
SBL	311	1	7	18	70	381	251	1	2	7	27	278
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	431	4	9	20	84	515	273	5	2	7	33	306
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	398	14	11	19	100	498	949	5	2	12	48	997
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	0	0	0	0	0	0	0	0	0	0	0	0
WBT	1,391	14	4	7	50	1,441	337	5	0	1	11	348
WBR	0	0	0	0	0	0	0	0	0	0	0	0
North Leg												
Approach	742	5	16	38	154	896	524	6	4	14	60	584
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	742	5	16	38	154	896	524	6	4	14	60	584
South Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
East Leg												
Approach	1,391	14	4	7	50	1,441	337	5	0	1	11	348
Departure	709	15	18	37	170	879	1,200	6	4	19	75	1,275
Total	2,100	29	22	44	220	2,320	1,537	11	4	20	86	1,623
West Leg												
Approach	398	14	11	19	100	498	949	5	2	12	48	997
Departure	1,822	18	13	27	134	1,956	610	10	2	8	44	654
Total	2,220	32	24	46	234	2,454	1,559	15	4	20	92	1,651
Total Approaches												
Approach	2,531	33	31	64	304	2,835	1,810	16	6	27	119	1,929
Departure	2,531	33	31	64	304	2,835	1,810	16	6	27	119	1,929
Total	5,062	66	62	128	608	5,670	3,620	32	12	54	238	3,858

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

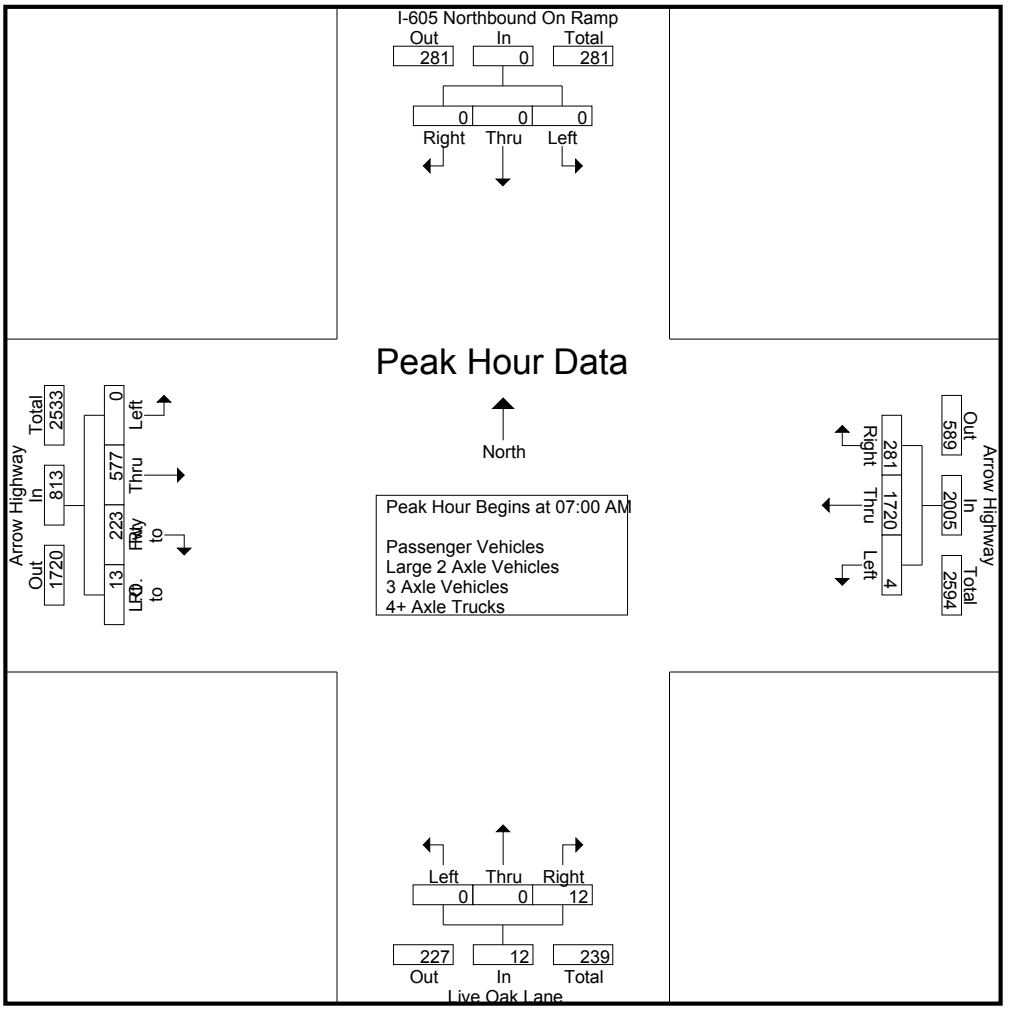
	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
07:00 AM	0	0	0	0	1	420	66	487	0	0	2	2	0	122	37	0	159	648
07:15 AM	0	0	0	0	2	473	65	540	0	0	1	1	0	117	57	4	178	719
07:30 AM	0	0	0	0	0	427	84	511	0	0	6	6	0	140	69	3	212	729
07:45 AM	0	0	0	0	1	400	66	467	0	0	3	3	0	198	60	6	264	734
Total	0	0	0	0	4	1720	281	2005	0	0	12	12	0	577	223	13	813	2830
08:00 AM	0	0	0	0	0	331	58	389	0	0	3	3	0	172	39	6	217	609
08:15 AM	0	0	0	0	1	292	52	345	0	0	6	6	0	203	47	2	252	603
08:30 AM	0	0	0	0	0	224	51	275	0	0	3	3	0	151	62	3	216	494
08:45 AM	0	0	0	0	0	195	51	246	0	0	4	4	0	144	47	6	197	447
Total	0	0	0	0	1	1042	212	1255	0	0	16	16	0	670	195	17	882	2153
Grand Total	0	0	0	0	5	2762	493	3260	0	0	28	28	0	1247	418	30	1695	4983
Apprch %	0	0	0		0.2	84.7	15.1		0	0	100		0	73.6	24.7	1.8		
Total %	0	0	0	0	0.1	55.4	9.9	65.4	0	0	0.6	0.6	0	25	8.4	0.6	34	
Passenger Vehicles	0	0	0	0	0	2667	452	3119	0	0	9	9	0	1147	320	13	1480	4608
% Passenger Vehicles	0	0	0	0	0	96.6	91.7	95.7	0	0	32.1	32.1	0	92	76.6	43.3	87.3	92.5
Large 2 Axle Vehicles	0	0	0	0	0	39	19	58	0	0	5	5	0	39	19	4	62	125
% Large 2 Axle Vehicles	0	0	0	0	0	1.4	3.9	1.8	0	0	17.9	17.9	0	3.1	4.5	13.3	3.7	2.5
3 Axle Vehicles	0	0	0	0	5	32	3	40	0	0	1	1	0	17	32	7	56	97
% 3 Axle Vehicles	0	0	0	0	100	1.2	0.6	1.2	0	0	3.6	3.6	0	1.4	7.7	23.3	3.3	1.9
4+ Axle Trucks	0	0	0	0	0	24	19	43	0	0	13	13	0	44	47	6	97	153
% 4+ Axle Trucks	0	0	0	0	0	0.9	3.9	1.3	0	0	46.4	46.4	0	3.5	11.2	20	5.7	3.1

	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:00 AM																		
07:00 AM	0	0	0	0	1	420	66	487	0	0	2	2	0	122	37	0	159	648
07:15 AM	0	0	0	0	**2**	**473**	65	**540**	0	0	1	1	0	117	57	4	178	719
07:30 AM	0	0	0	0	0	427	**84**	511	0	0	**6**	**6**	0	140	**69**	3	212	729
07:45 AM	0	0	0	0	1	400	66	467	0	0	3	3	0	**198**	60	**6**	**264**	**734**
Total Volume	0	0	0	0	4	1720	281	2005	0	0	12	12	0	577	223	13	813	2830
% App. Total	0	0	0		0.2	85.8	14		0	0	100		0	71	27.4	1.6		
PHF	.000	.000	.000	.000	.500	.909	.836	.928	.000	.000	.500	.500	.000	.729	.808	.542	.770	.964

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:30 AM				07:45 AM				
+0 mins.	0	0	0	0	1	420	66	487	0	0	**6**	**6**	0	198	60	**6**	**264**
+15 mins.	0	0	0	0	**2**	**473**	65	**540**	0	0	3	3	0	172	39	6	217
+30 mins.	0	0	0	0	0	427	**84**	511	0	0	3	3	0	**203**	47	2	252
+45 mins.	0	0	0	0	1	400	66	467	0	0	6	6	0	151	**62**	3	216
Total Volume	0	0	0	0	4	1720	281	2005	0	0	18	18	0	724	208	17	949
% App. Total	0	0	0		0.2	85.8	14		0	0	100		0	76.3	21.9	1.8	
PHF	.000	.000	.000	.000	.500	.909	.836	.928	.000	.000	.750	.750	.000	.892	.839	.708	.899

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles

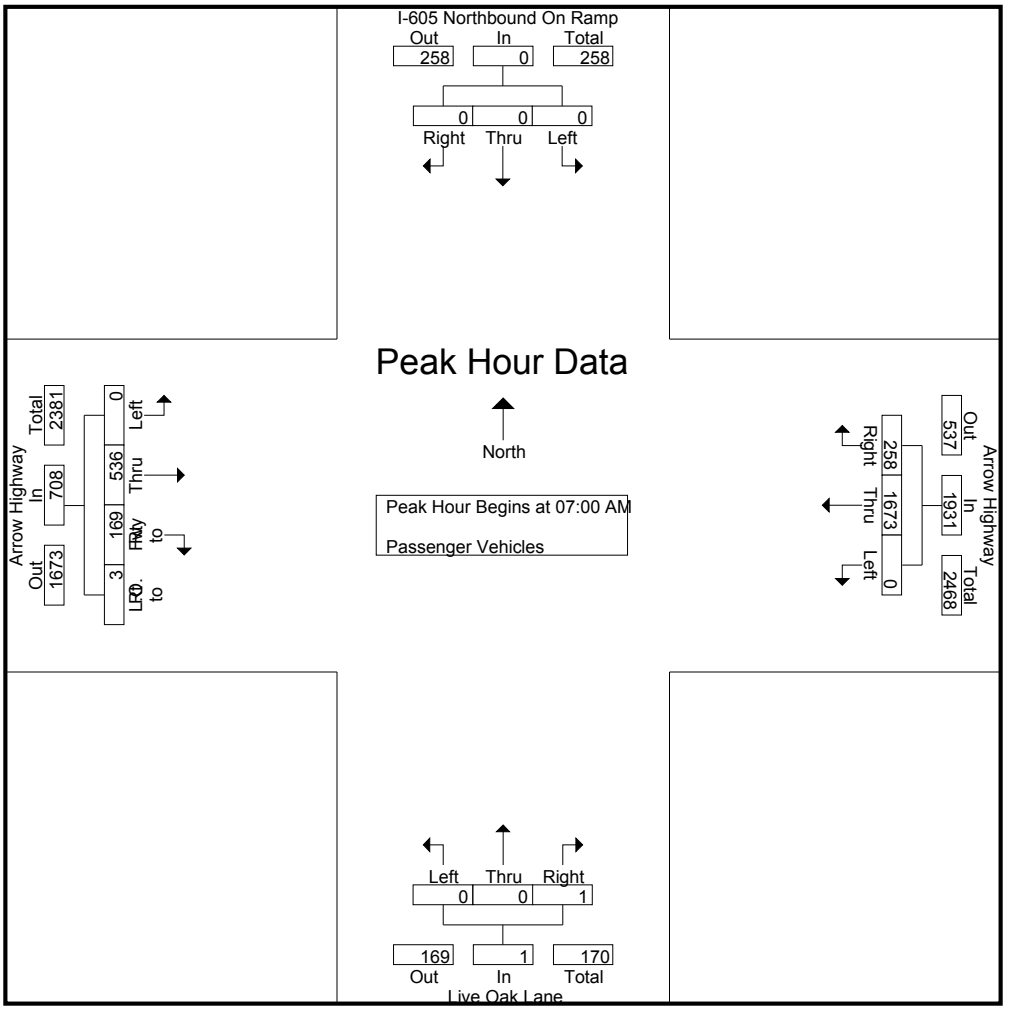
	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
07:00 AM	0	0	0	0	0	401	60	461	0	0	1	1	0	117	28	0	145	607
07:15 AM	0	0	0	0	0	461	64	525	0	0	0	0	0	107	40	1	148	673
07:30 AM	0	0	0	0	0	418	73	491	0	0	0	0	0	132	54	2	188	679
07:45 AM	0	0	0	0	0	393	61	454	0	0	0	0	0	180	47	0	227	681
Total	0	0	0	0	0	1673	258	1931	0	0	1	1	0	536	169	3	708	2640
08:00 AM	0	0	0	0	0	319	51	370	0	0	1	1	0	157	30	5	192	563
08:15 AM	0	0	0	0	0	281	47	328	0	0	4	4	0	190	32	0	222	554
08:30 AM	0	0	0	0	0	212	47	259	0	0	1	1	0	131	49	2	182	442
08:45 AM	0	0	0	0	0	182	49	231	0	0	2	2	0	133	40	3	176	409
Total	0	0	0	0	0	994	194	1188	0	0	8	8	0	611	151	10	772	1968
Grand Total	0	0	0	0	0	2667	452	3119	0	0	9	9	0	1147	320	13	1480	4608
Apprch %	0	0	0		0	85.5	14.5		0	0	100		0	77.5	21.6	0.9		
Total %	0	0	0	0	0	57.9	9.8	67.7	0	0	0.2	0.2	0	24.9	6.9	0.3	32.1	

	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:00 AM																		
07:00 AM	0	0	0	0	0	401	60	461	0	0	**1**	**1**	0	117	28	0	145	607
07:15 AM	0	0	0	0	0	**461**	64	**525**	0	0	0	0	0	107	40	1	148	673
07:30 AM	0	0	0	0	0	418	**73**	491	0	0	0	0	0	132	**54**	**2**	188	679
07:45 AM	0	0	0	0	0	393	61	454	0	0	0	0	0	**180**	47	0	**227**	**681**
Total Volume	0	0	0	0	0	1673	258	1931	0	0	1	1	0	536	169	3	708	2640
% App. Total	0	0	0		0	86.6	13.4		0	0	100		0	75.7	23.9	0.4		
PHF	.000	.000	.000	.000	.000	.907	.884	.920	.000	.000	.250	.250	.000	.744	.782	.375	.780	.969

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City of Irwindale
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File Name : IRW605NARAM
Site Code : 05116051
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Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	0	0	0	0	0	401	60	461	0	0	**1**	**1**	0	117	28	0	145
+15 mins.	0	0	0	0	0	**461**	64	**525**	0	0	0	0	0	107	40	1	148
+30 mins.	0	0	0	0	0	418	**73**	491	0	0	0	0	0	132	**54**	**2**	188
+45 mins.	0	0	0	0	0	393	61	454	0	0	0	0	0	**180**	47	0	**227**
Total Volume	0	0	0	0	0	1673	258	1931	0	0	1	1	0	536	169	3	708
% App. Total	0	0	0		0	86.6	13.4		0	0	100		0	75.7	23.9	0.4	
PHF	.000	.000	.000	.000	.000	.907	.884	.920	.000	.000	.250	.250	.000	.744	.782	.375	.780

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File Name : IRW605NARAM
Site Code : 05116051
Start Date : 1/27/2016
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Groups Printed- Large 2 Axle Vehicles

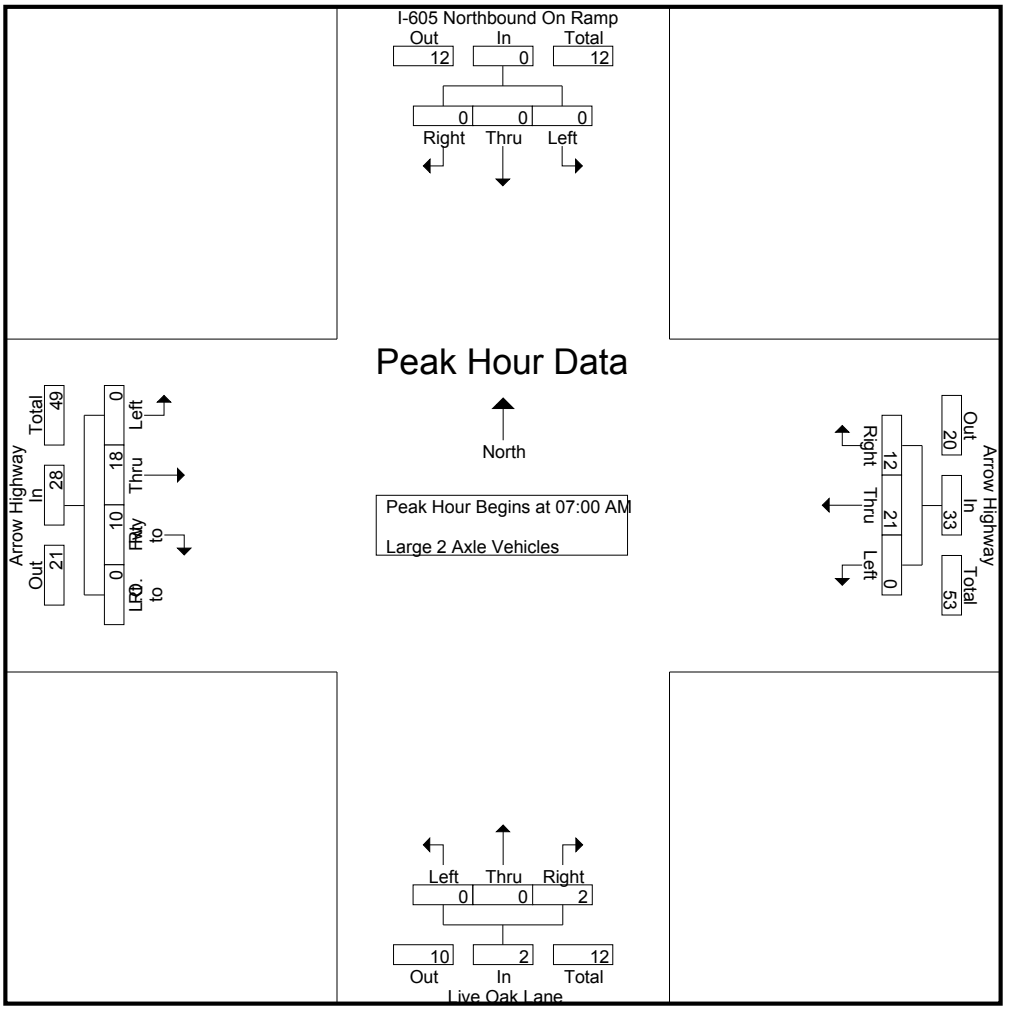
	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
07:00 AM	0	0	0	0	0	8	4	12	0	0	0	0	0	4	3	0	7	19
07:15 AM	0	0	0	0	0	7	1	8	0	0	1	1	0	2	3	0	5	14
07:30 AM	0	0	0	0	0	3	4	7	0	0	0	0	0	3	2	0	5	12
07:45 AM	0	0	0	0	0	3	3	6	0	0	1	1	0	9	2	0	11	18
Total	0	0	0	0	0	21	12	33	0	0	2	2	0	18	10	0	28	63
08:00 AM	0	0	0	0	0	2	2	4	0	0	1	1	0	3	3	0	6	11
08:15 AM	0	0	0	0	0	6	2	8	0	0	0	0	0	6	3	0	9	17
08:30 AM	0	0	0	0	0	6	2	8	0	0	0	0	0	7	2	1	10	18
08:45 AM	0	0	0	0	0	4	1	5	0	0	2	2	0	5	1	3	9	16
Total	0	0	0	0	0	18	7	25	0	0	3	3	0	21	9	4	34	62
Grand Total	0	0	0	0	0	39	19	58	0	0	5	5	0	39	19	4	62	125
Apprch %	0	0	0		0	67.2	32.8		0	0	100		0	62.9	30.6	6.5		
Total %	0	0	0	0	0	31.2	15.2	46.4	0	0	4	4	0	31.2	15.2	3.2	49.6	

	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:00 AM																		
07:00 AM	0	0	0	0	0	**8**	**4**	**12**	0	0	0	0	0	4	**3**	0	7	**19**
07:15 AM	0	0	0	0	0	7	1	8	0	0	**1**	**1**	0	2	3	0	5	14
07:30 AM	0	0	0	0	0	3	4	7	0	0	0	0	0	3	2	0	5	12
07:45 AM	0	0	0	0	0	3	3	6	0	0	1	1	0	**9**	2	0	**11**	18
Total Volume	0	0	0	0	0	21	12	33	0	0	2	2	0	18	10	0	28	63
% App. Total	0	0	0		0	63.6	36.4		0	0	100		0	64.3	35.7	0		
PHF	.000	.000	.000	.000	.000	.656	.750	.688	.000	.000	.500	.500	.000	.500	.833	.000	.636	.829

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City of Irwindale
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File Name : IRW605NARAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	0	0	0	0	0	**8**	**4**	**12**	0	0	0	0	0	4	**3**	0	7
+15 mins.	0	0	0	0	0	7	1	8	0	0	**1**	**1**	0	2	3	0	5
+30 mins.	0	0	0	0	0	3	4	7	0	0	0	0	0	3	2	0	5
+45 mins.	0	0	0	0	0	3	3	6	0	0	1	1	0	**9**	2	0	**11**
Total Volume	0	0	0	0	0	21	12	33	0	0	2	2	0	18	10	0	28
% App. Total	0	0	0		0	63.6	36.4		0	0	100		0	64.3	35.7	0	
PHF	.000	.000	.000	.000	.000	.656	.750	.688	.000	.000	.500	.500	.000	.500	.833	.000	.636

Counts Unlimited
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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 3 Axle Vehicles

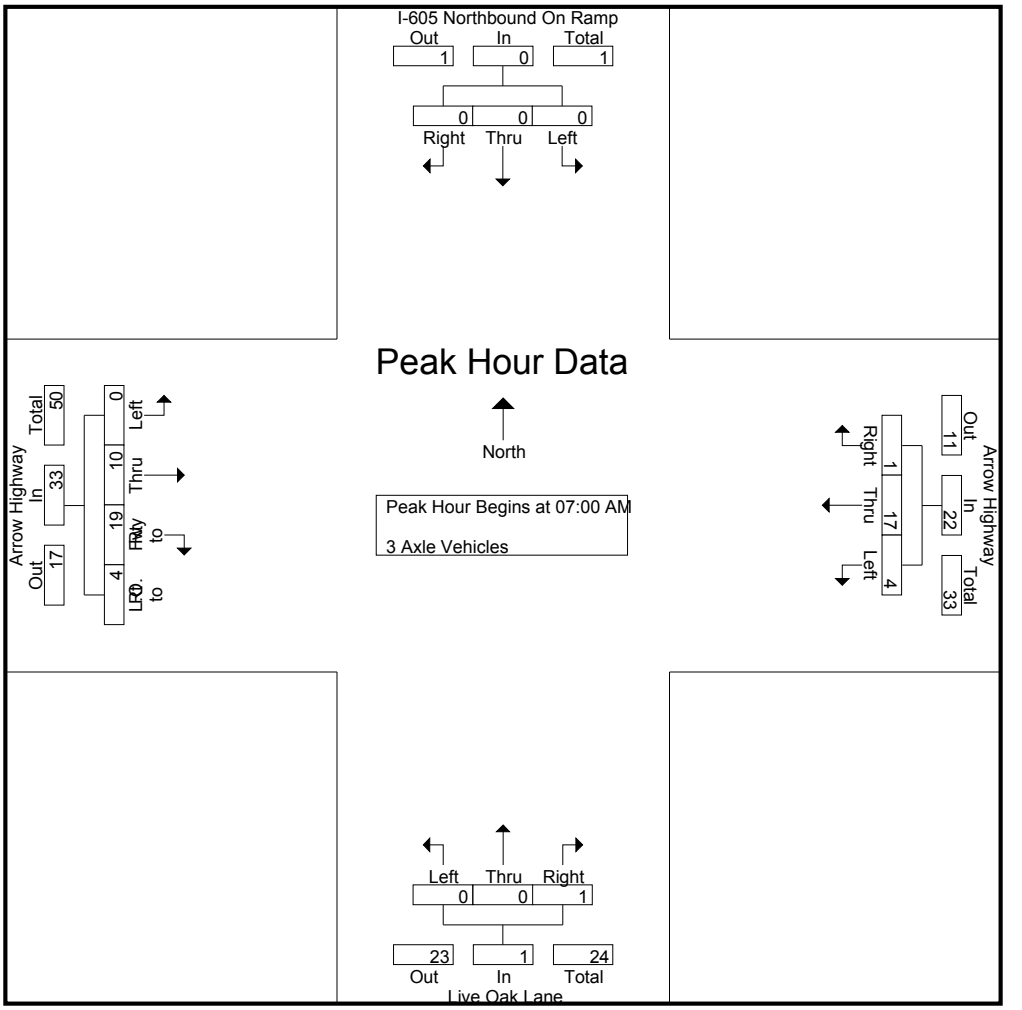
	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
07:00 AM	0	0	0	0	1	7	0	8	0	0	0	0	0	1	1	0	2	10
07:15 AM	0	0	0	0	2	4	0	6	0	0	0	0	0	3	7	0	10	16
07:30 AM	0	0	0	0	0	5	1	6	0	0	1	1	0	4	7	0	11	18
07:45 AM	0	0	0	0	1	1	0	2	0	0	0	0	0	2	4	4	10	12
Total	0	0	0	0	4	17	1	22	0	0	1	1	0	10	19	4	33	56
08:00 AM	0	0	0	0	0	6	2	8	0	0	0	0	0	0	2	1	3	11
08:15 AM	0	0	0	0	1	2	0	3	0	0	0	0	0	2	7	2	11	14
08:30 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	4	1	0	5	8
08:45 AM	0	0	0	0	0	4	0	4	0	0	0	0	0	1	3	0	4	8
Total	0	0	0	0	1	15	2	18	0	0	0	0	0	7	13	3	23	41
Grand Total	0	0	0	0	5	32	3	40	0	0	1	1	0	17	32	7	56	97
Apprch %	0	0	0		12.5	80	7.5		0	0	100		0	30.4	57.1	12.5		
Total %	0	0	0	0	5.2	33	3.1	41.2	0	0	1	1	0	17.5	33	7.2	57.7	

	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:00 AM																		
07:00 AM	0	0	0	0	1	**7**	0	**8**	0	0	0	0	0	1	1	0	2	10
07:15 AM	0	0	0	0	**2**	4	0	6	0	0	0	0	0	3	**7**	0	10	16
07:30 AM	0	0	0	0	0	5	**1**	6	0	0	**1**	**1**	0	**4**	7	0	**11**	**18**
07:45 AM	0	0	0	0	1	1	0	2	0	0	0	0	0	2	4	**4**	10	12
Total Volume	0	0	0	0	4	17	1	22	0	0	1	1	0	10	19	4	33	56
% App. Total	0	0	0		18.2	77.3	4.5		0	0	100		0	30.3	57.6	12.1		
PHF	.000	.000	.000	.000	.500	.607	.250	.688	.000	.000	.250	.250	.000	.625	.679	.250	.750	.778

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	0	0	0	0	1	**7**	0	**8**	0	0	0	0	0	1	1	0	2
+15 mins.	0	0	0	0	**2**	4	0	6	0	0	0	0	0	3	**7**	0	10
+30 mins.	0	0	0	0	0	5	**1**	6	0	0	**1**	**1**	0	**4**	7	0	**11**
+45 mins.	0	0	0	0	1	1	0	2	0	0	0	0	0	2	4	**4**	10
Total Volume	0	0	0	0	4	17	1	22	0	0	1	1	0	10	19	4	33
% App. Total	0	0	0		18.2	77.3	4.5		0	0	100		0	30.3	57.6	12.1	
PHF	.000	.000	.000	.000	.500	.607	.250	.688	.000	.000	.250	.250	.000	.625	.679	.250	.750

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 4+ Axle Trucks

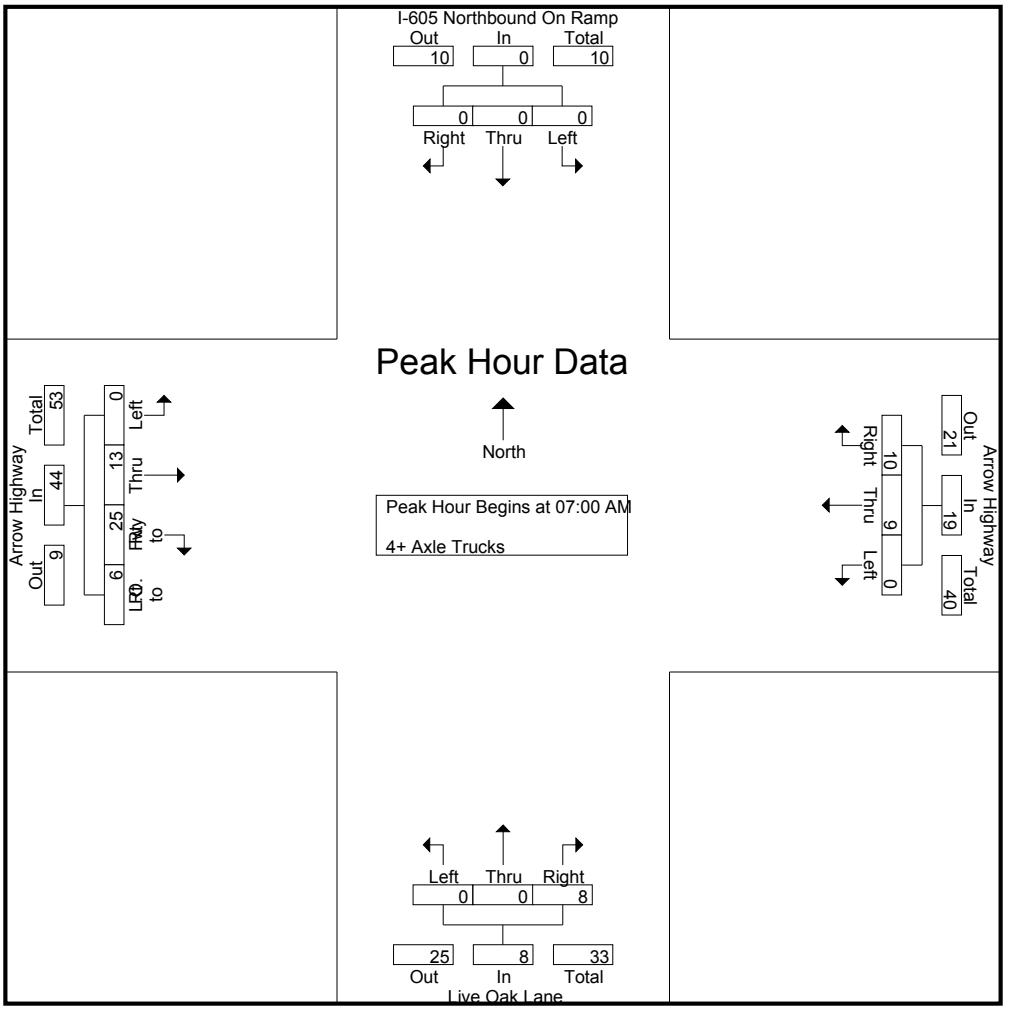
	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
07:00 AM	0	0	0	0	0	4	2	6	0	0	1	1	0	0	5	0	5	12
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	5	7	3	15	16
07:30 AM	0	0	0	0	0	1	6	7	0	0	5	5	0	1	6	1	8	20
07:45 AM	0	0	0	0	0	3	2	5	0	0	2	2	0	7	7	2	16	23
Total	0	0	0	0	0	9	10	19	0	0	8	8	0	13	25	6	44	71
08:00 AM	0	0	0	0	0	4	3	7	0	0	1	1	0	12	4	0	16	24
08:15 AM	0	0	0	0	0	3	3	6	0	0	2	2	0	5	5	0	10	18
08:30 AM	0	0	0	0	0	3	2	5	0	0	2	2	0	9	10	0	19	26
08:45 AM	0	0	0	0	0	5	1	6	0	0	0	0	0	5	3	0	8	14
Total	0	0	0	0	0	15	9	24	0	0	5	5	0	31	22	0	53	82
Grand Total	0	0	0	0	0	24	19	43	0	0	13	13	0	44	47	6	97	153
Apprch %	0	0	0		0	55.8	44.2		0	0	100		0	45.4	48.5	6.2		
Total %	0	0	0	0	0	15.7	12.4	28.1	0	0	8.5	8.5	0	28.8	30.7	3.9	63.4	

	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:00 AM																		
07:00 AM	0	0	0	0	0	**4**	2	6	0	0	1	1	0	0	5	0	5	12
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	5	**7**	**3**	15	16
07:30 AM	0	0	0	0	0	1	**6**	**7**	0	0	**5**	**5**	0	1	6	1	8	20
07:45 AM	0	0	0	0	0	3	2	5	0	0	2	2	0	**7**	7	2	**16**	**23**
Total Volume	0	0	0	0	0	9	10	19	0	0	8	8	0	13	25	6	44	71
% App. Total	0	0	0		0	47.4	52.6		0	0	100		0	29.5	56.8	13.6		
PHF	.000	.000	.000	.000	.000	.563	.417	.679	.000	.000	.400	.400	.000	.464	.893	.500	.688	.772

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	0	0	0	0	0	**4**	2	6	0	0	1	1	0	0	5	0	5
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	5	**7**	**3**	15
+30 mins.	0	0	0	0	0	1	**6**	**7**	0	0	**5**	**5**	0	1	6	1	8
+45 mins.	0	0	0	0	0	3	2	5	0	0	2	2	0	**7**	7	2	**16**
Total Volume	0	0	0	0	0	9	10	19	0	0	8	8	0	13	25	6	44
% App. Total	0	0	0		0	47.4	52.6		0	0	100		0	29.5	56.8	13.6	
PHF	.000	.000	.000	.000	.000	.563	.417	.679	.000	.000	.400	.400	.000	.464	.893	.500	.688

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

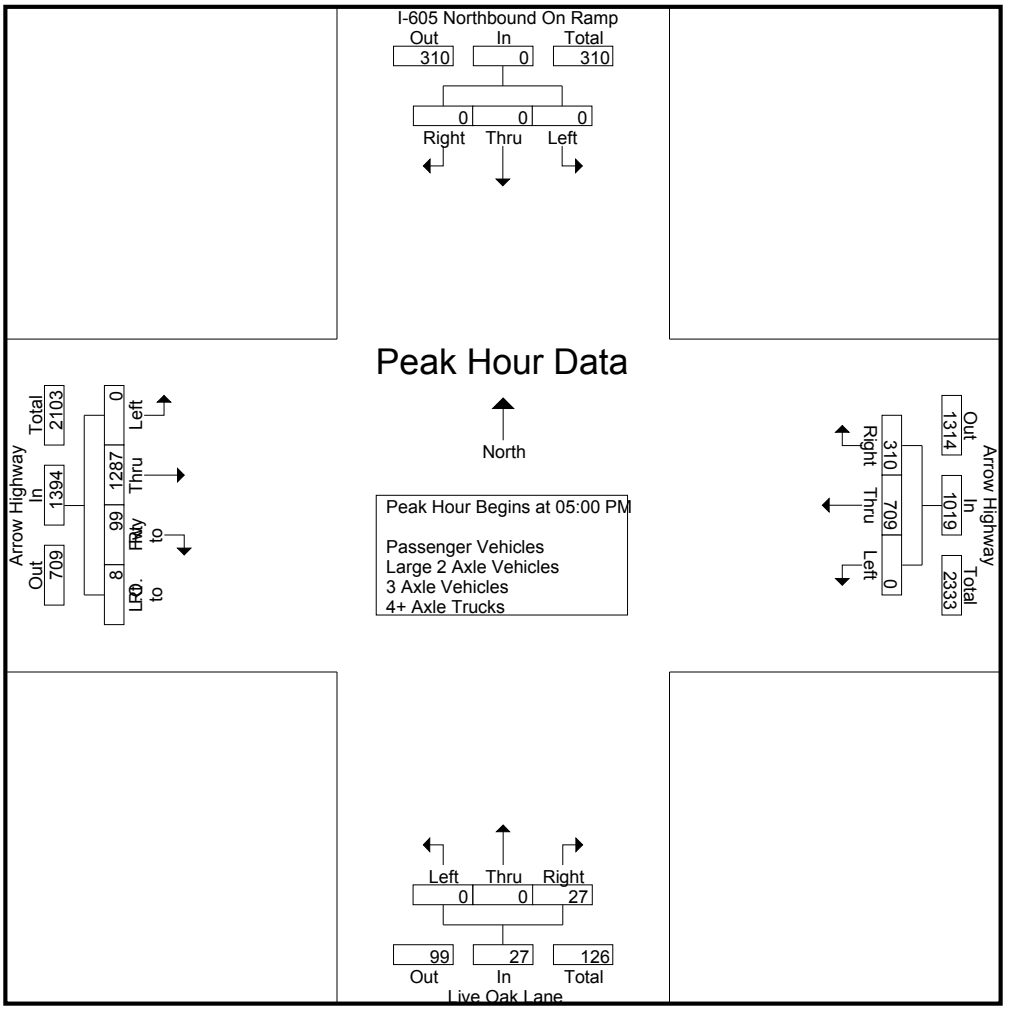
	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
04:00 PM	0	0	0	0	0	128	60	188	0	0	7	7	0	255	19	3	277	472
04:15 PM	0	0	0	0	0	97	50	147	0	0	7	7	0	280	23	1	304	458
04:30 PM	0	0	0	0	0	109	66	175	0	0	6	6	0	309	17	0	326	507
04:45 PM	0	0	0	0	0	142	52	194	0	0	10	10	0	280	24	3	307	511
Total	0	0	0	0	0	476	228	704	0	0	30	30	0	1124	83	7	1214	1948
05:00 PM	0	0	0	0	0	150	82	232	0	0	7	7	0	365	21	1	387	626
05:15 PM	0	0	0	0	0	188	80	268	0	0	13	13	0	344	19	2	365	646
05:30 PM	0	0	0	0	0	171	79	250	0	0	2	2	0	320	24	3	347	599
05:45 PM	0	0	0	0	0	200	69	269	0	0	5	5	0	258	35	2	295	569
Total	0	0	0	0	0	709	310	1019	0	0	27	27	0	1287	99	8	1394	2440
Grand Total	0	0	0	0	0	1185	538	1723	0	0	57	57	0	2411	182	15	2608	4388
Apprch %	0	0	0		0	68.8	31.2		0	0	100		0	92.4	7	0.6		
Total %	0	0	0	0	0	27	12.3	39.3	0	0	1.3	1.3	0	54.9	4.1	0.3	59.4	
Passenger Vehicles	0	0	0	0	0	1153	524	1677	0	0	48	48	0	2340	167	6	2513	4238
% Passenger Vehicles	0	0	0	0	0	97.3	97.4	97.3	0	0	84.2	84.2	0	97.1	91.8	40	96.4	96.6
Large 2 Axle Vehicles	0	0	0	0	0	20	4	24	0	0	3	3	0	36	1	0	37	64
% Large 2 Axle Vehicles	0	0	0	0	0	1.7	0.7	1.4	0	0	5.3	5.3	0	1.5	0.5	0	1.4	1.5
3 Axle Vehicles	0	0	0	0	0	5	4	9	0	0	3	3	0	22	5	1	28	40
% 3 Axle Vehicles	0	0	0	0	0	0.4	0.7	0.5	0	0	5.3	5.3	0	0.9	2.7	6.7	1.1	0.9
4+ Axle Trucks	0	0	0	0	0	7	6	13	0	0	3	3	0	13	9	8	30	46
% 4+ Axle Trucks	0	0	0	0	0	0.6	1.1	0.8	0	0	5.3	5.3	0	0.5	4.9	53.3	1.2	1

	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 05:00 PM																		
05:00 PM	0	0	0	0	0	150	**82**	232	0	0	7	7	0	**365**	21	1	**387**	626
05:15 PM	0	0	0	0	0	188	80	268	0	0	**13**	**13**	0	344	19	2	365	**646**
05:30 PM	0	0	0	0	0	171	79	250	0	0	2	2	0	320	24	**3**	347	599
05:45 PM	0	0	0	0	0	**200**	69	**269**	0	0	5	5	0	258	**35**	2	295	569
Total Volume	0	0	0	0	0	709	310	1019	0	0	27	27	0	1287	99	8	1394	2440
% App. Total	0	0	0		0	69.6	30.4		0	0	100		0	92.3	7.1	0.6		
PHF	.000	.000	.000	.000	.000	.886	.945	.947	.000	.000	.519	.519	.000	.882	.707	.667	.901	.944

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:30 PM				04:45 PM				
+0 mins.	0	0	0	0	0	150	**82**	232	0	0	6	6	0	280	**24**	**3**	307
+15 mins.	0	0	0	0	0	188	80	268	0	0	10	10	0	**365**	21	1	**387**
+30 mins.	0	0	0	0	0	171	79	250	0	0	7	7	0	344	19	2	365
+45 mins.	0	0	0	0	0	**200**	69	**269**	0	0	**13**	**13**	0	320	24	3	347
Total Volume	0	0	0	0	0	709	310	1019	0	0	36	36	0	1309	88	9	1406
% App. Total	0	0	0		0	69.6	30.4		0	0	100		0	93.1	6.3	0.6	
PHF	.000	.000	.000	.000	.000	.886	.945	.947	.000	.000	.692	.692	.000	.897	.917	.750	.908

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
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Weather: Clear

File Name : IRW605NARPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles

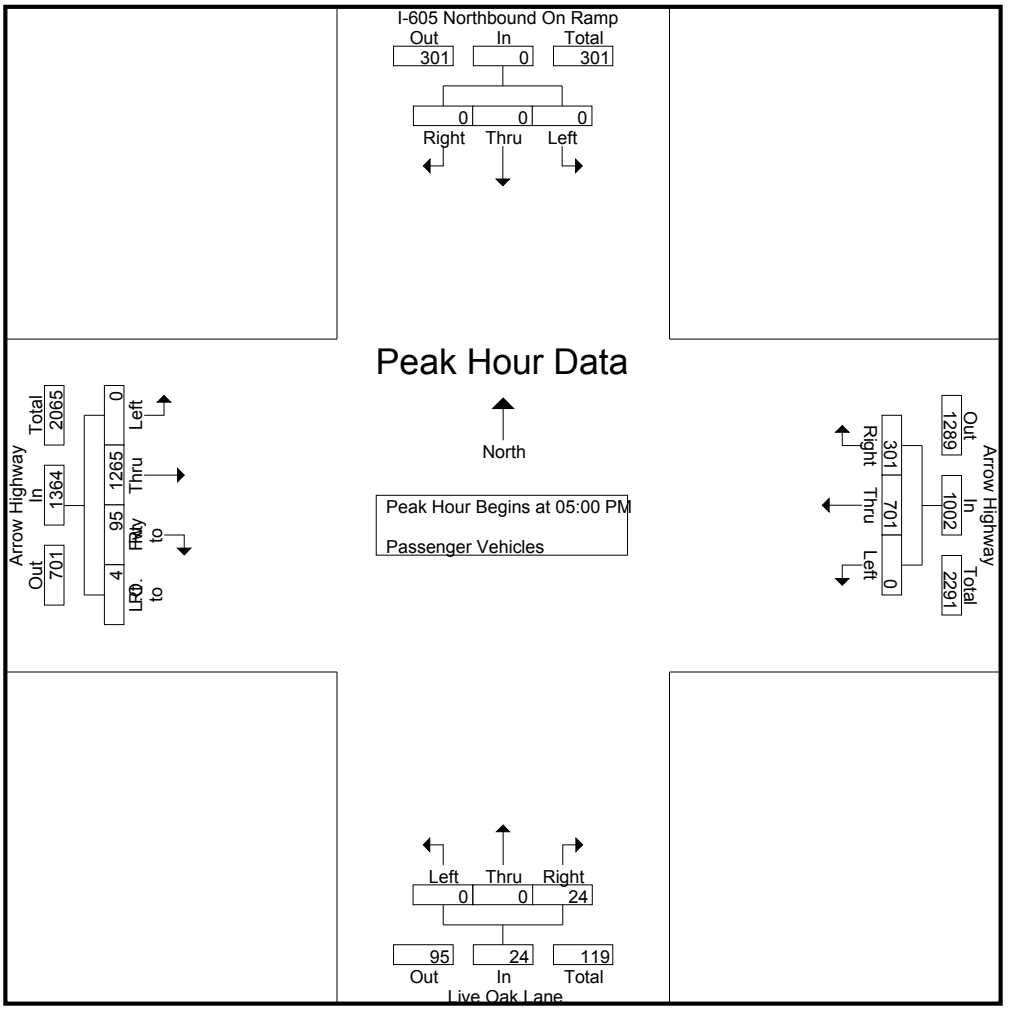
	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
04:00 PM	0	0	0	0	0	118	60	178	0	0	5	5	0	246	16	1	263	446
04:15 PM	0	0	0	0	0	95	48	143	0	0	5	5	0	264	19	0	283	431
04:30 PM	0	0	0	0	0	103	63	166	0	0	5	5	0	291	14	0	305	476
04:45 PM	0	0	0	0	0	136	52	188	0	0	9	9	0	274	23	1	298	495
Total	0	0	0	0	0	452	223	675	0	0	24	24	0	1075	72	2	1149	1848
05:00 PM	0	0	0	0	0	149	78	227	0	0	6	6	0	357	21	1	379	612
05:15 PM	0	0	0	0	0	187	79	266	0	0	13	13	0	342	18	2	362	641
05:30 PM	0	0	0	0	0	167	77	244	0	0	2	2	0	310	22	0	332	578
05:45 PM	0	0	0	0	0	198	67	265	0	0	3	3	0	256	34	1	291	559
Total	0	0	0	0	0	701	301	1002	0	0	24	24	0	1265	95	4	1364	2390
Grand Total	0	0	0	0	0	1153	524	1677	0	0	48	48	0	2340	167	6	2513	4238
Apprch %	0	0	0		0	68.8	31.2		0	0	100		0	93.1	6.6	0.2		
Total %	0	0	0	0	0	27.2	12.4	39.6	0	0	1.1	1.1	0	55.2	3.9	0.1	59.3	

	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 05:00 PM																		
05:00 PM	0	0	0	0	0	149	78	227	0	0	6	6	0	**357**	21	1	**379**	612
05:15 PM	0	0	0	0	0	187	**79**	**266**	0	0	**13**	**13**	0	342	18	**2**	362	**641**
05:30 PM	0	0	0	0	0	167	77	244	0	0	2	2	0	310	22	0	332	578
05:45 PM	0	0	0	0	0	**198**	67	265	0	0	3	3	0	256	**34**	1	291	559
Total Volume	0	0	0	0	0	701	301	1002	0	0	24	24	0	1265	95	4	1364	2390
% App. Total	0	0	0		0	70	30		0	0	100		0	92.7	7	0.3		
PHF	.000	.000	.000	.000	.000	.885	.953	.942	.000	.000	.462	.462	.000	.886	.699	.500	.900	.932

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM				
+0 mins.	0	0	0	0	0	149	78	227	0	0	6	6	0	**357**	21	1	**379**
+15 mins.	0	0	0	0	0	187	**79**	**266**	0	0	**13**	**13**	0	342	18	**2**	362
+30 mins.	0	0	0	0	0	167	77	244	0	0	2	2	0	310	22	0	332
+45 mins.	0	0	0	0	0	**198**	67	265	0	0	3	3	0	256	**34**	1	291
Total Volume	0	0	0	0	0	701	301	1002	0	0	24	24	0	1265	95	4	1364
% App. Total	0	0	0		0	70	30		0	0	100		0	92.7	7	0.3	
PHF	.000	.000	.000	.000	.000	.885	.953	.942	.000	.000	.462	.462	.000	.886	.699	.500	.900

Counts Unlimited
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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Large 2 Axle Vehicles

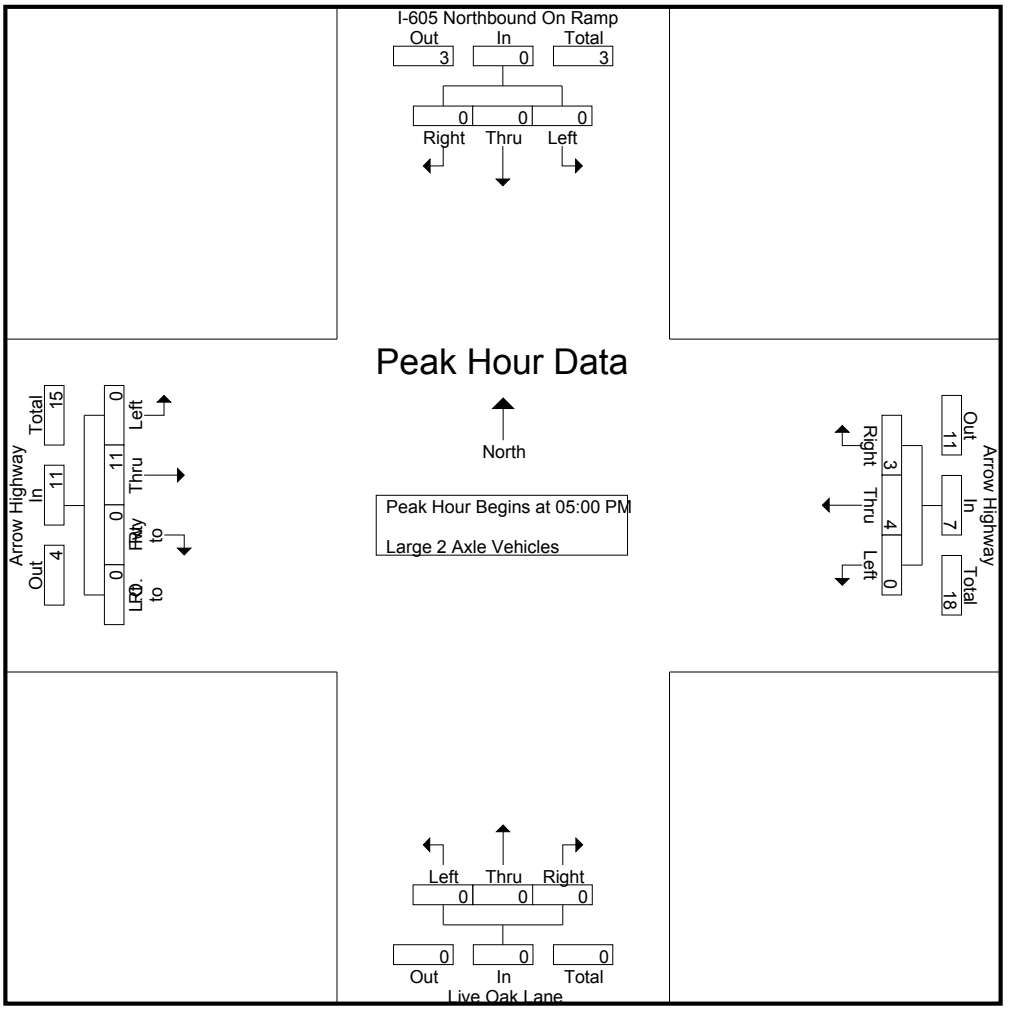
	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
04:00 PM	0	0	0	0	0	6	0	6	0	0	1	1	0	4	0	0	4	11
04:15 PM	0	0	0	0	0	2	0	2	0	0	1	1	0	11	0	0	11	14
04:30 PM	0	0	0	0	0	4	1	5	0	0	0	0	0	7	1	0	8	13
04:45 PM	0	0	0	0	0	4	0	4	0	0	1	1	0	3	0	0	3	8
Total	0	0	0	0	0	16	1	17	0	0	3	3	0	25	1	0	26	46
05:00 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	4	0	0	4	6
05:15 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	1	2
05:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	5	0	0	5	7
05:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	0	1	3
Total	0	0	0	0	0	4	3	7	0	0	0	0	0	11	0	0	11	18
Grand Total	0	0	0	0	0	20	4	24	0	0	3	3	0	36	1	0	37	64
Apprch %	0	0	0		0	83.3	16.7		0	0	100		0	97.3	2.7	0		
Total %	0	0	0	0	0	31.2	6.2	37.5	0	0	4.7	4.7	0	56.2	1.6	0	57.8	

	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 05:00 PM																		
05:00 PM	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	4	0	0	4	6
05:15 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	1	2
05:30 PM	0	0	0	0	0	**2**	0	2	0	0	0	0	0	**5**	0	0	**5**	**7**
05:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	0	1	3
Total Volume	0	0	0	0	0	4	3	7	0	0	0	0	0	11	0	0	11	18
% App. Total	0	0	0		0	57.1	42.9		0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.500	.375	.875	.000	.000	.000	.000	.000	.550	.000	.000	.550	.643

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM				
+0 mins.	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	4	0	0	4
+15 mins.	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	1
+30 mins.	0	0	0	0	0	**2**	0	2	0	0	0	0	0	**5**	0	0	**5**
+45 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	0	1
Total Volume	0	0	0	0	0	4	3	7	0	0	0	0	0	11	0	0	11
% App. Total	0	0	0		0	57.1	42.9		0	0	0		0	100	0	0	
PHF	.000	.000	.000	.000	.000	.500	.375	.875	.000	.000	.000	.000	.000	.550	.000	.000	.550

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 3 Axle Vehicles

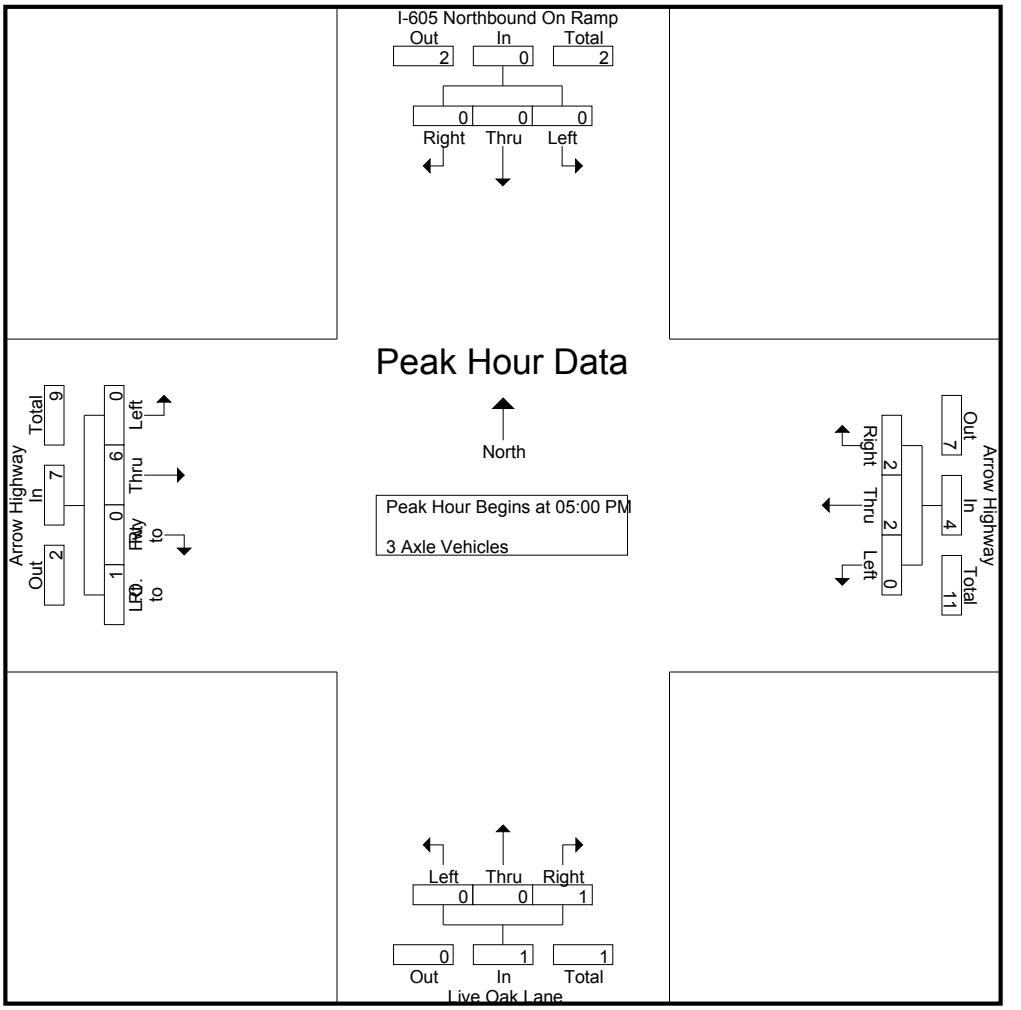
	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
04:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	2	2	0	4	5
04:15 PM	0	0	0	0	0	0	1	1	0	0	1	1	0	3	1	0	4	6
04:30 PM	0	0	0	0	0	1	1	2	0	0	1	1	0	9	2	0	11	14
04:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	0	2	3
Total	0	0	0	0	0	3	2	5	0	0	2	2	0	16	5	0	21	28
05:00 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	3	0	0	3	4
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
05:30 PM	0	0	0	0	0	2	1	3	0	0	0	0	0	2	0	0	2	5
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	2
Total	0	0	0	0	0	2	2	4	0	0	1	1	0	6	0	1	7	12
Grand Total	0	0	0	0	0	5	4	9	0	0	3	3	0	22	5	1	28	40
Apprch %	0	0	0		0	55.6	44.4		0	0	100		0	78.6	17.9	3.6		
Total %	0	0	0	0	0	12.5	10	22.5	0	0	7.5	7.5	0	55	12.5	2.5	70	

	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 05:00 PM																		
05:00 PM	0	0	0	0	0	0	**1**	1	0	0	0	0	0	**3**	0	0	**3**	4
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
05:30 PM	0	0	0	0	0	**2**	1	**3**	0	0	0	0	0	2	0	0	2	**5**
05:45 PM	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	**1**	1	2
Total Volume	0	0	0	0	0	2	2	4	0	0	1	1	0	6	0	1	7	12
% App. Total	0	0	0		0	50	50		0	0	100		0	85.7	0	14.3		
PHF	.000	.000	.000	.000	.000	.250	.500	.333	.000	.000	.250	.250	.000	.500	.000	.250	.583	.600

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM				
+0 mins.	0	0	0	0	0	0	**1**	1	0	0	0	0	0	**3**	0	0	**3**
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
+30 mins.	0	0	0	0	0	**2**	1	**3**	0	0	0	0	0	2	0	0	2
+45 mins.	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	**1**	1
Total Volume	0	0	0	0	0	2	2	4	0	0	1	1	0	6	0	1	7
% App. Total	0	0	0		0	50	50		0	0	100		0	85.7	0	14.3	
PHF	.000	.000	.000	.000	.000	.250	.500	.333	.000	.000	.250	.250	.000	.500	.000	.250	.583

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 4+ Axle Trucks

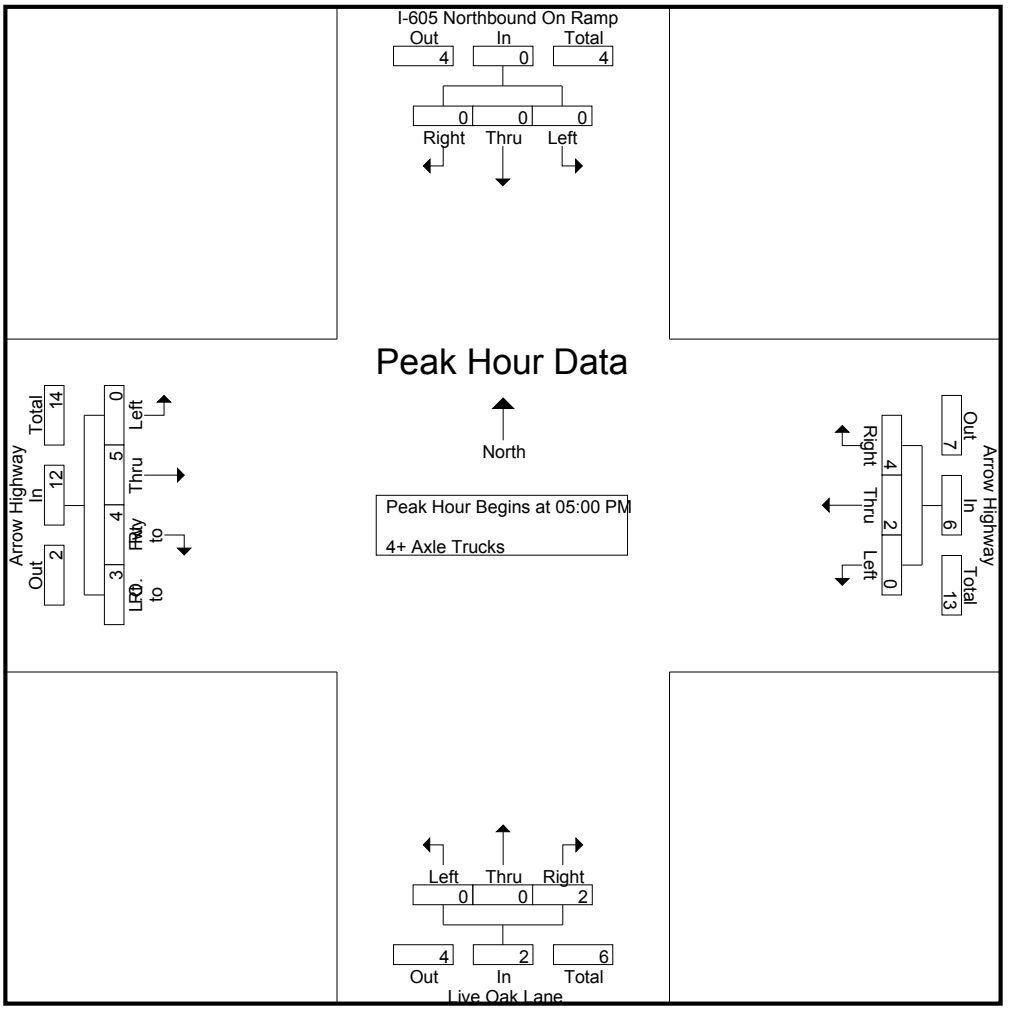
	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
04:00 PM	0	0	0	0	0	3	0	3	0	0	1	1	0	3	1	2	6	10
04:15 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	2	3	1	6	7
04:30 PM	0	0	0	0	0	1	1	2	0	0	0	0	0	2	0	0	2	4
04:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	2	4	5
Total	0	0	0	0	0	5	2	7	0	0	1	1	0	8	5	5	18	26
05:00 PM	0	0	0	0	0	1	1	2	0	0	1	1	0	1	0	0	1	4
05:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	2
05:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	3	2	3	8	9
05:45 PM	0	0	0	0	0	0	2	2	0	0	1	1	0	1	1	0	2	5
Total	0	0	0	0	0	2	4	6	0	0	2	2	0	5	4	3	12	20
Grand Total	0	0	0	0	0	7	6	13	0	0	3	3	0	13	9	8	30	46
Apprch %	0	0	0		0	53.8	46.2		0	0	100		0	43.3	30	26.7		
Total %	0	0	0	0	0	15.2	13	28.3	0	0	6.5	6.5	0	28.3	19.6	17.4	65.2	

	I-605 Northbound On Ramp Southbound				Arrow Highway Westbound				Live Oak Lane Northbound				Arrow Highway Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Rt to Fwy	Rt to L.O.	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 05:00 PM																		
05:00 PM	0	0	0	0	0	**1**	1	**2**	0	0	**1**	**1**	0	1	0	0	1	4
05:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	2
05:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	**3**	**2**	**3**	**8**	**9**
05:45 PM	0	0	0	0	0	0	**2**	2	0	0	1	1	0	1	1	0	2	5
Total Volume	0	0	0	0	0	2	4	6	0	0	2	2	0	5	4	3	12	20
% App. Total	0	0	0		0	33.3	66.7		0	0	100		0	41.7	33.3	25		
PHF	.000	.000	.000	.000	.000	.500	.500	.750	.000	.000	.500	.500	.000	.417	.500	.250	.375	.556

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City of Irwindale
N/S: I-605 Northbound Ramp/Live Oak Lane
E/W: Arrow Highway
Weather: Clear

File Name : IRW605NARPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM				
+0 mins.	0	0	0	0	0	**1**	1	**2**	0	0	**1**	**1**	0	1	0	0	1
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1
+30 mins.	0	0	0	0	0	0	1	1	0	0	0	0	0	**3**	**2**	**3**	**8**
+45 mins.	0	0	0	0	0	0	**2**	2	0	0	1	1	0	1	1	0	2
Total Volume	0	0	0	0	0	2	4	6	0	0	2	2	0	5	4	3	12
% App. Total	0	0	0		0	33.3	66.7		0	0	100		0	41.7	33.3	25	
PHF	.000	.000	.000	.000	.000	.500	.500	.750	.000	.000	.500	.500	.000	.417	.500	.250	.375

Existing (2016) PCE Conversion

4. I-605 NB On-Ramp/Live Oak Ln. / Arrow Hwy.

	AM PEAK HOUR													AM TOTAL	PM PEAK HOUR												PM TOTAL
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR FWY.	EBR	WBL	WBT	WBR		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR FWY.	EBR	WBL	WBT	WBR	
Existing (2016)																												
- Passenger Vehicles	0	0	1	0	0	0	0	536	169	3	0	1,673	258	2,640	0	0	24	0	0	0	0	1,265	95	4	0	701	301	2,390
- 2-Axle Trucks	0	0	2	0	0	0	0	18	10	0	0	21	12	63	0	0	0	0	0	0	0	11	0	0	0	4	3	18
- 3-Axle Trucks	0	0	1	0	0	0	0	10	19	4	0	17	1	52	0	0	1	0	0	0	0	6	0	1	0	2	2	12
- 4-Axle or more Trucks	0	0	8	0	0	0	0	13	25	6	0	9	10	71	0	0	2	0	0	0	0	5	4	3	0	2	4	20
Total Existing (2016) Actual Vehicles	0	0	12	0	0	0	0	577	223	13	0	1,720	281	2,826	0	0	27	0	0	0	0	1,287	99	8	0	709	310	2,440
Passenger Car Equivalent (PCE)																												
- Passenger Vehicles	0	0	1	0	0	0	0	536	169	3	0	1,673	258	2,640	0	0	24	0	0	0	0	1,265	95	4	0	701	301	2,390
- 2-Axle Trucks (PCE Factor = 1.5)	0	0	3	0	0	0	0	27	15	0	0	32	18	95	0	0	0	0	0	0	0	17	0	0	0	6	5	28
- 3-Axle Trucks (PCE Factor = 2.0)	0	0	2	0	0	0	0	20	38	8	0	34	2	104	0	0	2	0	0	0	0	12	0	2	0	4	4	24
- 4-Axle or more (PCE Factor = 3.0)	0	0	24	0	0	0	0	39	75	18	0	27	30	213	0	0	6	0	0	0	0	15	12	9	0	6	12	60
Total Existing (2016) PCE	0	0	30	0	0	0	0	622	297	29	0	1,766	308	3,052	0	0	32	0	0	0	0	1,309	107	15	0	717	322	2,502

	South Leg			North Leg			West Leg			East Leg				South Leg			North Leg			West Leg				East Leg			
Link Volumes	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total		IN	OUT	Total	IN	OUT	Total	IN	OUT		Total	IN	OUT	Total	
Total Existing (2016) Actual Vehicles	12	223	235	0	281	281	813	1,720	2,533	2,001	589	2,590		27	8	35	0	310	310	1,394	709	2,103		1,019	1,314	2,333	
Total Existing (2016) PCE	30	297	327	0	308	308	948	1,766	2,714	2,074	652	2,726		32	15	47	0	322	322	1,431	717	2,148		1,039	1,341	2,380	

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City of Irwindale
N/S: Arrow Highway
E/W: Rivergrade Road
Weather: Clear

File Name : IRWARRIAM
Site Code : 05114207
Start Date : 5/14/2014
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

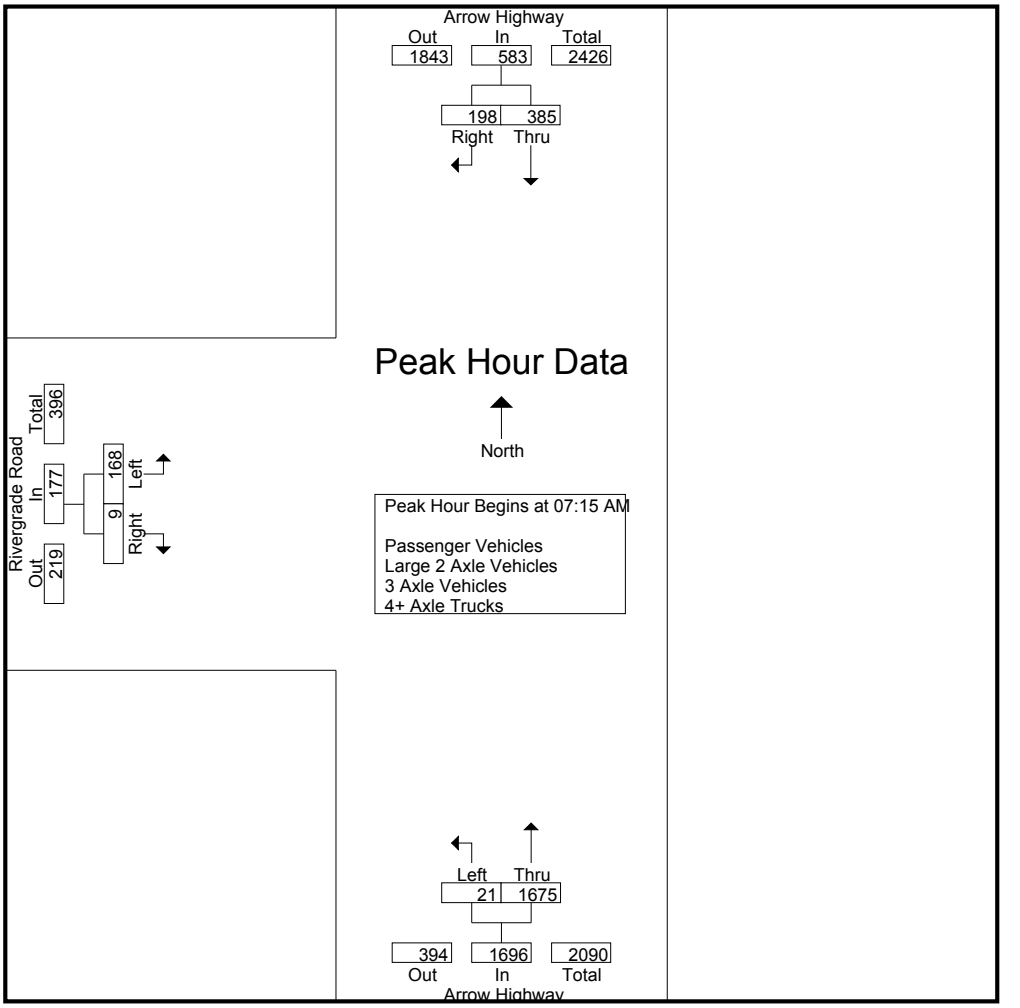
	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	59	40	99	6	369	375	37	1	38	512
07:15 AM	60	42	102	7	492	499	36	0	36	637
07:30 AM	93	45	138	1	475	476	48	5	53	667
07:45 AM	124	50	174	8	378	386	51	2	53	613
Total	336	177	513	22	1714	1736	172	8	180	2429
08:00 AM	108	61	169	5	330	335	33	2	35	539
08:15 AM	92	61	153	3	303	306	41	0	41	500
08:30 AM	80	58	138	10	237	247	39	3	42	427
08:45 AM	88	56	144	6	236	242	26	2	28	414
Total	368	236	604	24	1106	1130	139	7	146	1880
Grand Total	704	413	1117	46	2820	2866	311	15	326	4309
Apprch %	63	37		1.6	98.4		95.4	4.6		
Total %	16.3	9.6	25.9	1.1	65.4	66.5	7.2	0.3	7.6	
Passenger Vehicles	648	308	956	45	2652	2697	233	9	242	3895
% Passenger Vehicles	92	74.6	85.6	97.8	94	94.1	74.9	60	74.2	90.4
Large 2 Axle Vehicles	40	21	61	0	126	126	24	5	29	216
% Large 2 Axle Vehicles	5.7	5.1	5.5	0	4.5	4.4	7.7	33.3	8.9	5
3 Axle Vehicles	8	22	30	0	17	17	13	1	14	61
% 3 Axle Vehicles	1.1	5.3	2.7	0	0.6	0.6	4.2	6.7	4.3	1.4
4+ Axle Trucks	8	62	70	1	25	26	41	0	41	137
% 4+ Axle Trucks	1.1	15	6.3	2.2	0.9	0.9	13.2	0	12.6	3.2

	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	60	42	102	7	**492**	**499**	36	0	36	637
07:30 AM	93	45	138	1	475	476	48	**5**	**53**	**667**
07:45 AM	**124**	50	**174**	**8**	378	386	**51**	2	53	613
08:00 AM	108	**61**	169	5	330	335	33	2	35	539
Total Volume	385	198	583	21	1675	1696	168	9	177	2456
% App. Total	66	34		1.2	98.8		94.9	5.1		
PHF	.776	.811	.838	.656	.851	.850	.824	.450	.835	.921

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Corona, CA 92878
(951) 268-6268

City of Irwindale
N/S: Arrow Highway
E/W: Rivergrade Road
Weather: Clear

File Name : IRWARRIAM
Site Code : 05114207
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			07:00 AM			07:30 AM		
+0 mins.	93	45	138	6	369	375	48	**5**	**53**
+15 mins.	**124**	50	**174**	7	**492**	**499**	**51**	2	53
+30 mins.	108	**61**	169	1	475	476	33	2	35
+45 mins.	92	61	153	**8**	378	386	41	0	41
Total Volume	417	217	634	22	1714	1736	173	9	182
% App. Total	65.8	34.2		1.3	98.7		95.1	4.9	
PHF	.841	.889	.911	.688	.871	.870	.848	.450	.858

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City of Irwindale
N/S: Arrow Highway
E/W: Rivergrade Road
Weather: Clear

File Name : IRWARRIAM
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Groups Printed- Passenger Vehicles

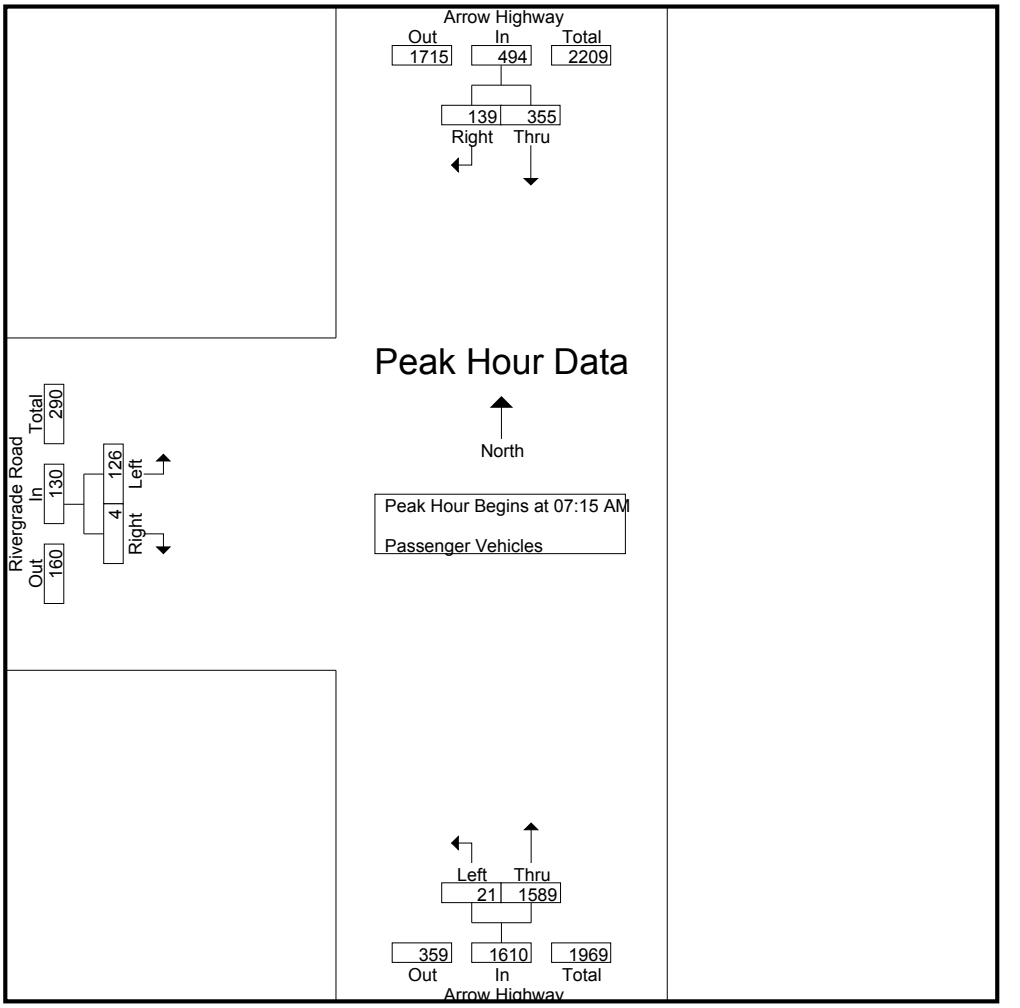
	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	56	31	87	6	346	352	31	1	32	471
07:15 AM	53	25	78	7	469	476	24	0	24	578
07:30 AM	84	28	112	1	454	455	41	1	42	609
07:45 AM	116	38	154	8	358	366	39	1	40	560
Total	309	122	431	22	1627	1649	135	3	138	2218
08:00 AM	102	48	150	5	308	313	22	2	24	487
08:15 AM	86	51	137	3	277	280	32	0	32	449
08:30 AM	73	45	118	9	219	228	28	3	31	377
08:45 AM	78	42	120	6	221	227	16	1	17	364
Total	339	186	525	23	1025	1048	98	6	104	1677
Grand Total	648	308	956	45	2652	2697	233	9	242	3895
Apprch %	67.8	32.2		1.7	98.3		96.3	3.7		
Total %	16.6	7.9	24.5	1.2	68.1	69.2	6	0.2	6.2	

	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	53	25	78	7	**469**	**476**	24	0	24	578
07:30 AM	84	28	112	1	454	455	**41**	1	**42**	**609**
07:45 AM	**116**	38	**154**	**8**	358	366	39	1	40	560
08:00 AM	102	**48**	150	5	308	313	22	**2**	24	487
Total Volume	355	139	494	21	1589	1610	126	4	130	2234
% App. Total	71.9	28.1		1.3	98.7		96.9	3.1		
PHF	.765	.724	.802	.656	.847	.846	.768	.500	.774	.917

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Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	53	25	78	7	**469**	**476**	24	0	24
+15 mins.	84	28	112	1	454	455	**41**	1	**42**
+30 mins.	**116**	38	**154**	**8**	358	366	39	1	40
+45 mins.	102	**48**	150	5	308	313	22	**2**	24
Total Volume	355	139	494	21	1589	1610	126	4	130
% App. Total	71.9	28.1		1.3	98.7		96.9	3.1	
PHF	.765	.724	.802	.656	.847	.846	.768	.500	.774

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Groups Printed- Large 2 Axle Vehicles

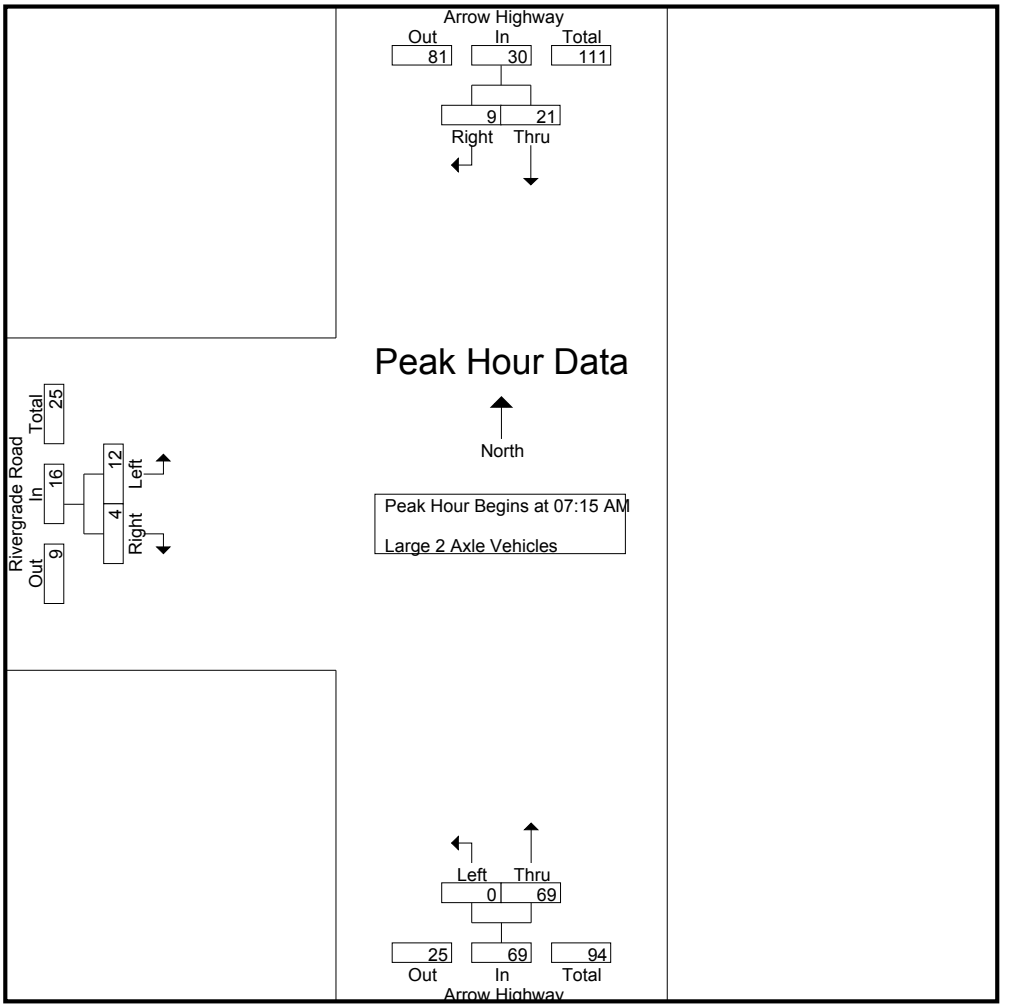
	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	1	3	4	0	14	14	3	0	3	21
07:15 AM	5	0	5	0	18	18	8	0	8	31
07:30 AM	6	4	10	0	20	20	1	3	4	34
07:45 AM	5	3	8	0	13	13	1	1	2	23
Total	17	10	27	0	65	65	13	4	17	109
08:00 AM	5	2	7	0	18	18	2	0	2	27
08:15 AM	5	3	8	0	21	21	2	0	2	31
08:30 AM	6	1	7	0	13	13	3	0	3	23
08:45 AM	7	5	12	0	9	9	4	1	5	26
Total	23	11	34	0	61	61	11	1	12	107
Grand Total	40	21	61	0	126	126	24	5	29	216
Apprch %	65.6	34.4		0	100		82.8	17.2		
Total %	18.5	9.7	28.2	0	58.3	58.3	11.1	2.3	13.4	

	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	5	0	5	0	18	18	**8**	0	**8**	31
07:30 AM	**6**	**4**	**10**	0	**20**	**20**	1	**3**	4	**34**
07:45 AM	5	3	8	0	13	13	1	1	2	23
08:00 AM	5	2	7	0	18	18	2	0	2	27
Total Volume	21	9	30	0	69	69	12	4	16	115
% App. Total	70	30		0	100		75	25		
PHF	.875	.563	.750	.000	.863	.863	.375	.333	.500	.846

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Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	5	0	5	0	18	18	**8**	0	**8**
+15 mins.	**6**	**4**	**10**	0	**20**	**20**	1	**3**	4
+30 mins.	5	3	8	0	13	13	1	1	2
+45 mins.	5	2	7	0	18	18	2	0	2
Total Volume	21	9	30	0	69	69	12	4	16
% App. Total	70	30		0	100		75	25	
PHF	.875	.563	.750	.000	.863	.863	.375	.333	.500

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Groups Printed- 3 Axle Vehicles

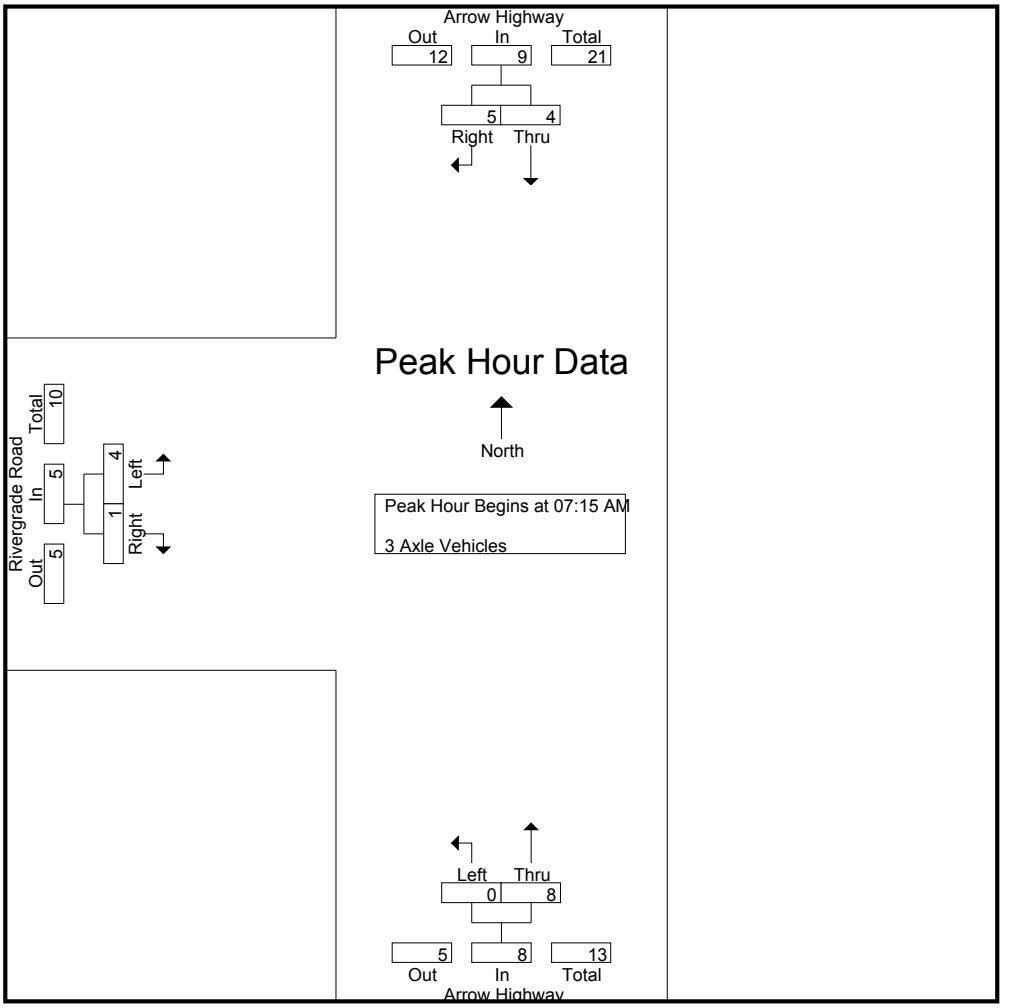
	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	2	1	3	0	3	3	0	0	0	6
07:15 AM	1	0	1	0	4	4	1	0	1	6
07:30 AM	1	0	1	0	0	0	1	1	2	3
07:45 AM	1	2	3	0	3	3	1	0	1	7
Total	5	3	8	0	10	10	3	1	4	22
08:00 AM	1	3	4	0	1	1	1	0	1	6
08:15 AM	1	2	3	0	3	3	3	0	3	9
08:30 AM	0	8	8	0	0	0	3	0	3	11
08:45 AM	1	6	7	0	3	3	3	0	3	13
Total	3	19	22	0	7	7	10	0	10	39
Grand Total	8	22	30	0	17	17	13	1	14	61
Apprch %	26.7	73.3		0	100		92.9	7.1		
Total %	13.1	36.1	49.2	0	27.9	27.9	21.3	1.6	23	

	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**1**	0	1	0	**4**	**4**	**1**	0	1	6
07:30 AM	1	0	1	0	0	0	1	**1**	**2**	3
07:45 AM	1	2	3	0	3	3	1	0	1	**7**
08:00 AM	1	**3**	**4**	0	1	1	1	0	1	6
Total Volume	4	5	9	0	8	8	4	1	5	22
% App. Total	44.4	55.6		0	100		80	20		
PHF	1.00	.417	.563	.000	.500	.500	1.00	.250	.625	.786

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Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	**1**	0	1	0	**4**	**4**	**1**	0	1
+15 mins.	1	0	1	0	0	0	1	**1**	**2**
+30 mins.	1	2	3	0	3	3	1	0	1
+45 mins.	1	**3**	**4**	0	1	1	1	0	1
Total Volume	4	5	9	0	8	8	4	1	5
% App. Total	44.4	55.6		0	100		80	20	
PHF	1.000	.417	.563	.000	.500	.500	1.000	.250	.625

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Groups Printed- 4+ Axle Trucks

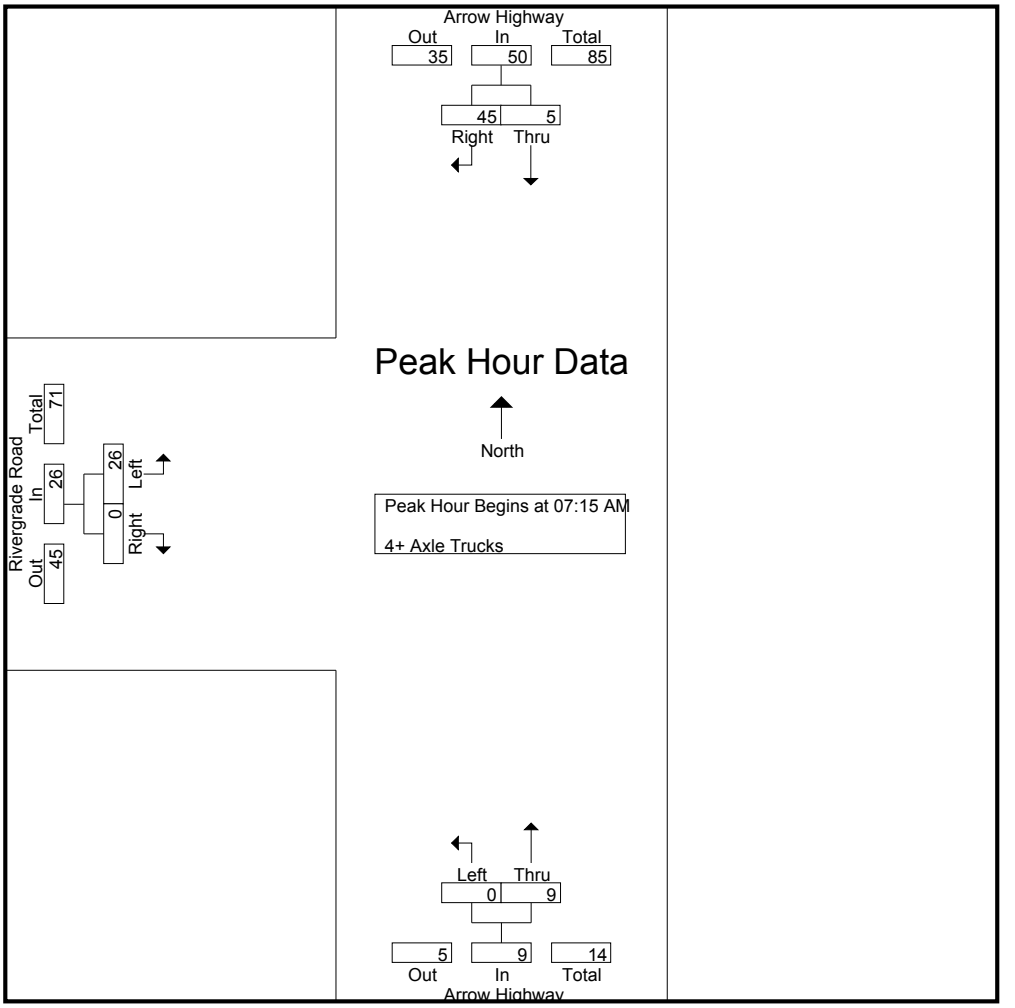
	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	0	5	5	0	6	6	3	0	3	14
07:15 AM	1	17	18	0	1	1	3	0	3	22
07:30 AM	2	13	15	0	1	1	5	0	5	21
07:45 AM	2	7	9	0	4	4	10	0	10	23
Total	5	42	47	0	12	12	21	0	21	80
08:00 AM	0	8	8	0	3	3	8	0	8	19
08:15 AM	0	5	5	0	2	2	4	0	4	11
08:30 AM	1	4	5	1	5	6	5	0	5	16
08:45 AM	2	3	5	0	3	3	3	0	3	11
Total	3	20	23	1	13	14	20	0	20	57
Grand Total	8	62	70	1	25	26	41	0	41	137
Apprch %	11.4	88.6		3.8	96.2		100	0		
Total %	5.8	45.3	51.1	0.7	18.2	19	29.9	0	29.9	

	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	1	**17**	**18**	0	1	1	3	0	3	22
07:30 AM	**2**	13	15	0	1	1	5	0	5	21
07:45 AM	2	7	9	0	**4**	**4**	**10**	0	**10**	**23**
08:00 AM	0	8	8	0	3	3	8	0	8	19
Total Volume	5	45	50	0	9	9	26	0	26	85
% App. Total	10	90		0	100		100	0		
PHF	.625	.662	.694	.000	.563	.563	.650	.000	.650	.924

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Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	1	**17**	**18**	0	1	1	3	0	3
+15 mins.	**2**	13	15	0	1	1	5	0	5
+30 mins.	2	7	9	0	**4**	**4**	**10**	0	**10**
+45 mins.	0	8	8	0	3	3	8	0	8
Total Volume	5	45	50	0	9	9	26	0	26
% App. Total	10	90		0	100		100	0	
PHF	.625	.662	.694	.000	.563	.563	.650	.000	.650

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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

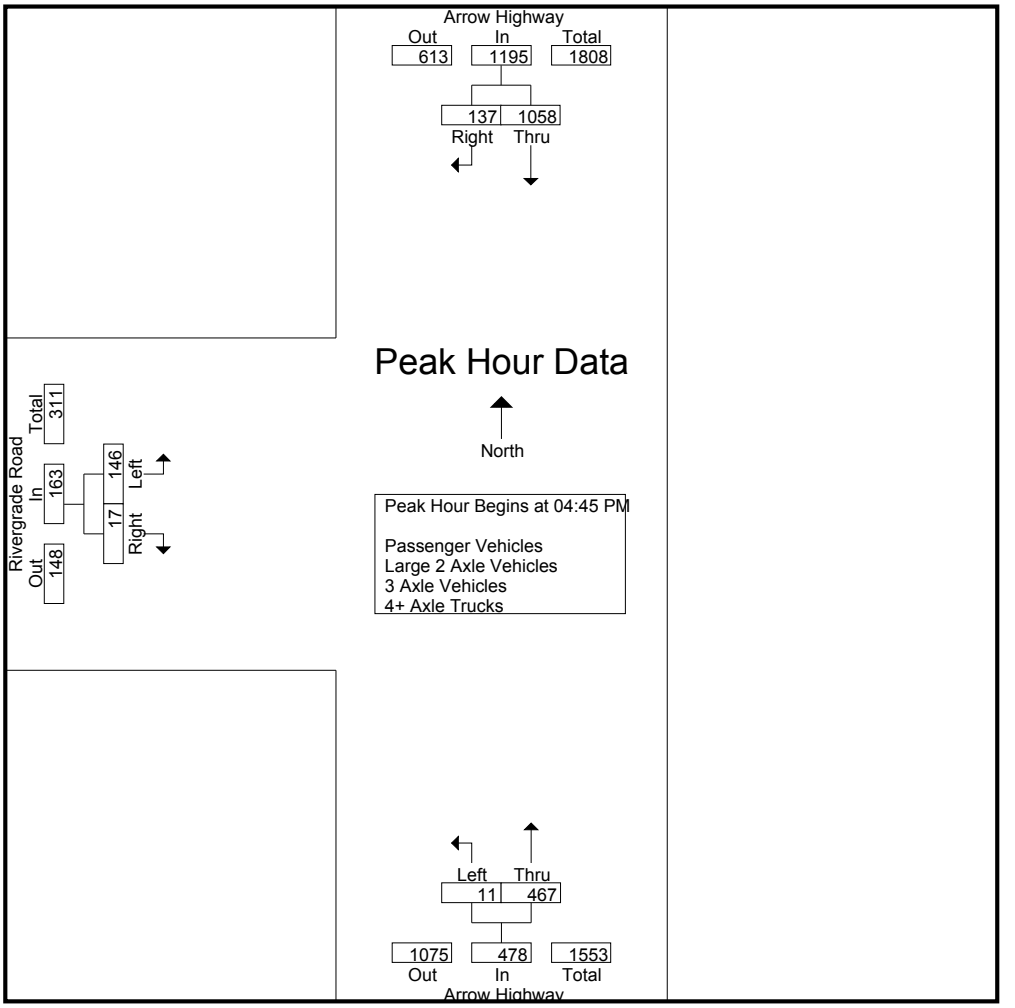
	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	197	32	229	7	101	108	26	6	32	369
04:15 PM	242	24	266	0	105	105	13	3	16	387
04:30 PM	229	42	271	2	126	128	36	8	44	443
04:45 PM	282	34	316	1	109	110	27	3	30	456
Total	950	132	1082	10	441	451	102	20	122	1655
05:00 PM	271	27	298	4	123	127	45	6	51	476
05:15 PM	252	37	289	1	124	125	28	2	30	444
05:30 PM	253	39	292	5	111	116	46	6	52	460
05:45 PM	210	25	235	1	88	89	28	3	31	355
Total	986	128	1114	11	446	457	147	17	164	1735
Grand Total	1936	260	2196	21	887	908	249	37	286	3390
Apprch %	88.2	11.8		2.3	97.7		87.1	12.9		
Total %	57.1	7.7	64.8	0.6	26.2	26.8	7.3	1.1	8.4	
Passenger Vehicles	1828	236	2064	6	838	844	238	35	273	3181
% Passenger Vehicles	94.4	90.8	94	28.6	94.5	93	95.6	94.6	95.5	93.8
Large 2 Axle Vehicles	79	18	97	1	37	38	6	0	6	141
% Large 2 Axle Vehicles	4.1	6.9	4.4	4.8	4.2	4.2	2.4	0	2.1	4.2
3 Axle Vehicles	28	2	30	14	6	20	1	1	2	52
% 3 Axle Vehicles	1.4	0.8	1.4	66.7	0.7	2.2	0.4	2.7	0.7	1.5
4+ Axle Trucks	1	4	5	0	6	6	4	1	5	16
% 4+ Axle Trucks	0.1	1.5	0.2	0	0.7	0.7	1.6	2.7	1.7	0.5

	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	**282**	34	**316**	1	109	110	27	3	30	456
05:00 PM	271	27	298	4	123	**127**	45	**6**	51	**476**
05:15 PM	252	37	289	1	**124**	125	28	2	30	444
05:30 PM	253	**39**	292	**5**	111	116	**46**	6	**52**	460
Total Volume	1058	137	1195	11	467	478	146	17	163	1836
% App. Total	88.5	11.5		2.3	97.7		89.6	10.4		
PHF	.938	.878	.945	.550	.942	.941	.793	.708	.784	.964

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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:30 PM			05:00 PM		
+0 mins.	**282**	34	**316**	2	**126**	**128**	45	**6**	51
+15 mins.	271	27	298	1	109	110	28	2	30
+30 mins.	252	37	289	**4**	123	127	**46**	6	**52**
+45 mins.	253	**39**	292	1	124	125	28	3	31
Total Volume	1058	137	1195	8	482	490	147	17	164
% App. Total	88.5	11.5		1.6	98.4		89.6	10.4	
PHF	.938	.878	.945	.500	.956	.957	.799	.708	.788

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Groups Printed- Passenger Vehicles

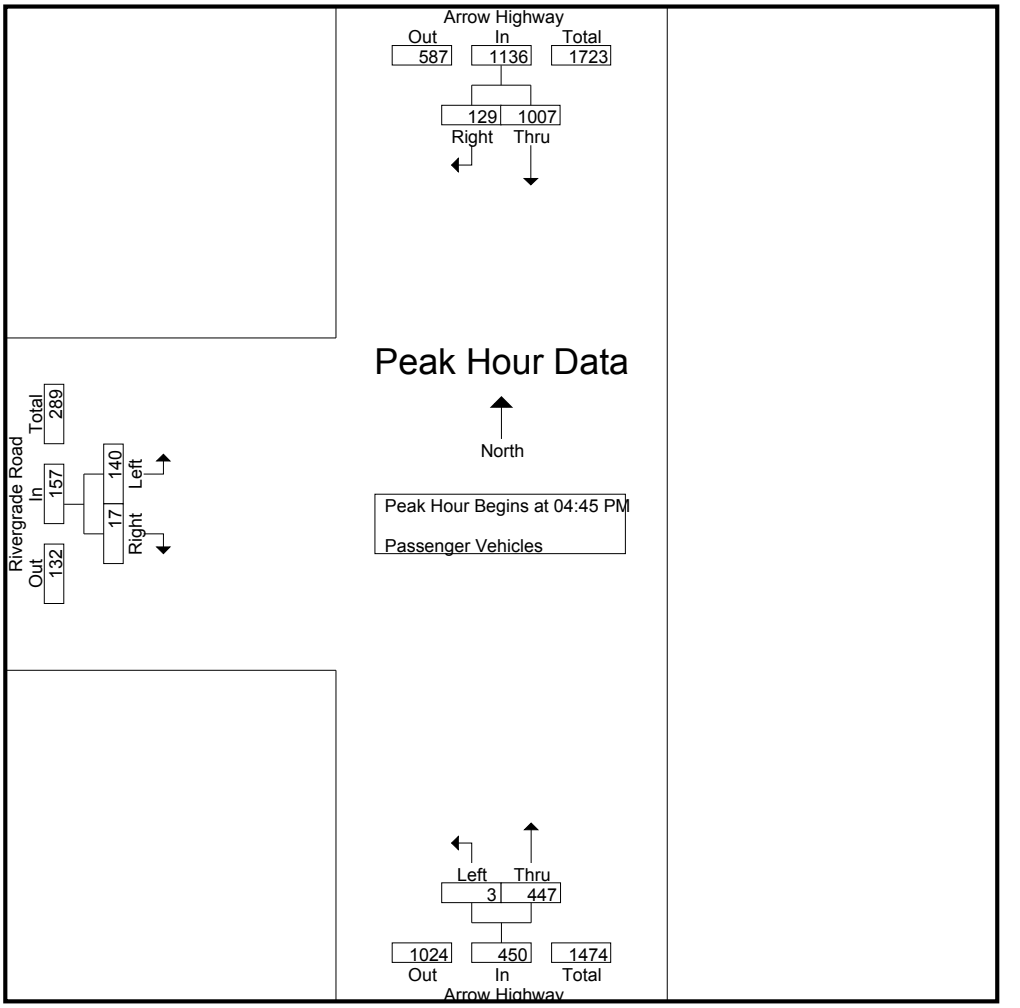
	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	185	25	210	3	90	93	26	5	31	334
04:15 PM	225	21	246	0	100	100	13	3	16	362
04:30 PM	204	37	241	0	116	116	34	7	41	398
04:45 PM	262	32	294	0	102	102	26	3	29	425
Total	876	115	991	3	408	411	99	18	117	1519
05:00 PM	260	27	287	0	123	123	44	6	50	460
05:15 PM	242	33	275	1	117	118	24	2	26	419
05:30 PM	243	37	280	2	105	107	46	6	52	439
05:45 PM	207	24	231	0	85	85	25	3	28	344
Total	952	121	1073	3	430	433	139	17	156	1662
Grand Total	1828	236	2064	6	838	844	238	35	273	3181
Apprch %	88.6	11.4		0.7	99.3		87.2	12.8		
Total %	57.5	7.4	64.9	0.2	26.3	26.5	7.5	1.1	8.6	

	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	**262**	32	**294**	0	102	102	26	3	29	425
05:00 PM	260	27	287	0	**123**	**123**	44	**6**	50	**460**
05:15 PM	242	33	275	1	117	118	24	2	26	419
05:30 PM	243	**37**	280	**2**	105	107	**46**	6	**52**	439
Total Volume	1007	129	1136	3	447	450	140	17	157	1743
% App. Total	88.6	11.4		0.7	99.3		89.2	10.8		
PHF	.961	.872	.966	.375	.909	.915	.761	.708	.755	.947

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City of Irwindale
N/S: Arrow Highway
E/W: Rivergrade Road
Weather: Clear

File Name : IRWARRIPM
Site Code : 05114207
Start Date : 5/14/2014
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Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	**262**	32	**294**	0	102	102	26	3	29
+15 mins.	260	27	287	0	**123**	**123**	44	**6**	50
+30 mins.	242	33	275	1	117	118	24	2	26
+45 mins.	243	**37**	280	**2**	105	107	**46**	6	**52**
Total Volume	1007	129	1136	3	447	450	140	17	157
% App. Total	88.6	11.4		0.7	99.3		89.2	10.8	
PHF	.961	.872	.966	.375	.909	.915	.761	.708	.755

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City of Irwindale
N/S: Arrow Highway
E/W: Rivergrade Road
Weather: Clear

File Name : IRWARRIPM
Site Code : 05114207
Start Date : 5/14/2014
Page No : 1

Groups Printed- Large 2 Axle Vehicles

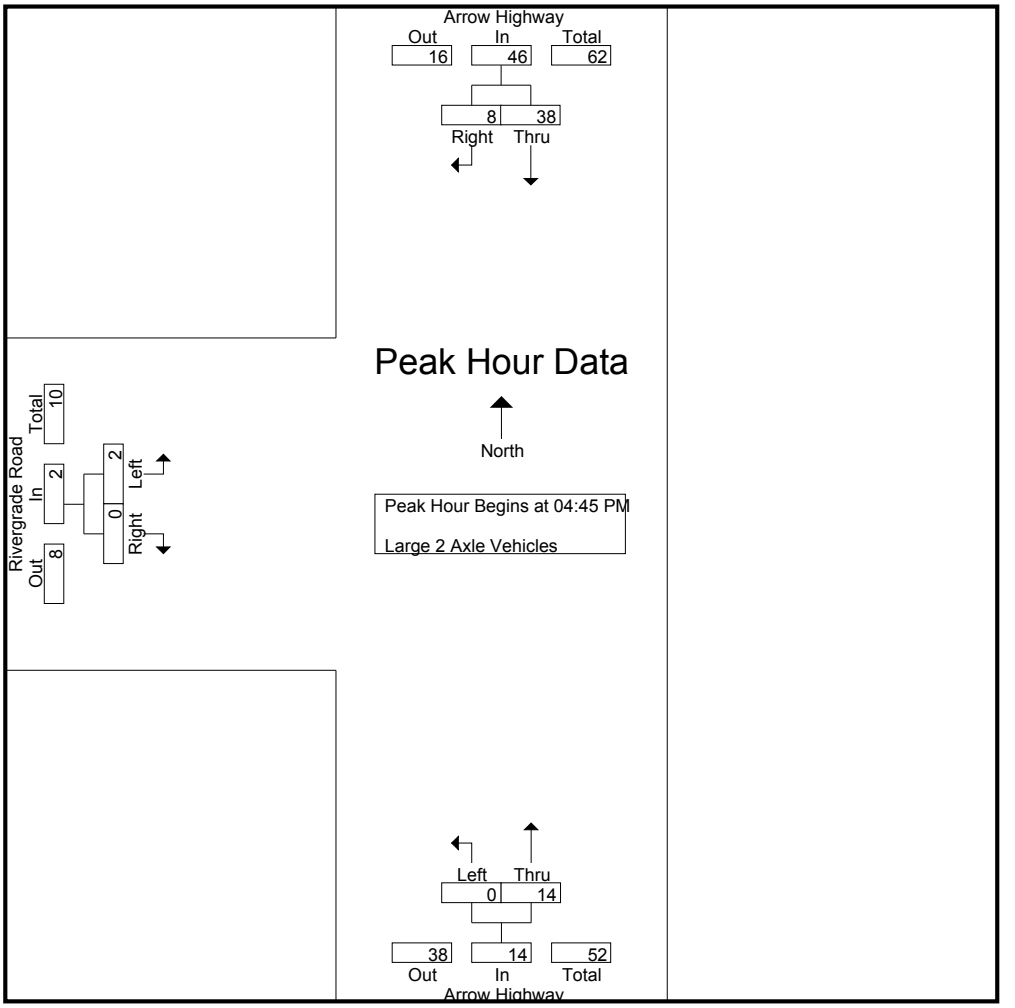
	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	6	4	10	1	9	10	0	0	0	20
04:15 PM	13	1	14	0	5	5	0	0	0	19
04:30 PM	20	4	24	0	6	6	2	0	2	32
04:45 PM	15	2	17	0	6	6	0	0	0	23
Total	54	11	65	1	26	27	2	0	2	94
05:00 PM	8	0	8	0	0	0	1	0	1	9
05:15 PM	6	4	10	0	3	3	1	0	1	14
05:30 PM	9	2	11	0	5	5	0	0	0	16
05:45 PM	2	1	3	0	3	3	2	0	2	8
Total	25	7	32	0	11	11	4	0	4	47
Grand Total	79	18	97	1	37	38	6	0	6	141
Apprch %	81.4	18.6		2.6	97.4		100	0		
Total %	56	12.8	68.8	0.7	26.2	27	4.3	0	4.3	

	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	**15**	2	**17**	0	**6**	**6**	0	0	0	**23**
05:00 PM	8	0	8	0	0	0	**1**	0	**1**	9
05:15 PM	6	**4**	10	0	3	3	1	0	1	14
05:30 PM	9	2	11	0	5	5	0	0	0	16
Total Volume	38	8	46	0	14	14	2	0	2	62
% App. Total	82.6	17.4		0	100		100	0		
PHF	.633	.500	.676	.000	.583	.583	.500	.000	.500	.674

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Weather: Clear

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Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	**15**	2	**17**	0	**6**	**6**	0	0	0
+15 mins.	8	0	8	0	0	0	**1**	0	**1**
+30 mins.	6	**4**	10	0	3	3	1	0	1
+45 mins.	9	2	11	0	5	5	0	0	0
Total Volume	38	8	46	0	14	14	2	0	2
% App. Total	82.6	17.4		0	100		100	0	
PHF	.633	.500	.676	.000	.583	.583	.500	.000	.500

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City of Irwindale
N/S: Arrow Highway
E/W: Rivergrade Road
Weather: Clear

File Name : IRWARRIPM
Site Code : 05114207
Start Date : 5/14/2014
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Groups Printed- 3 Axle Vehicles

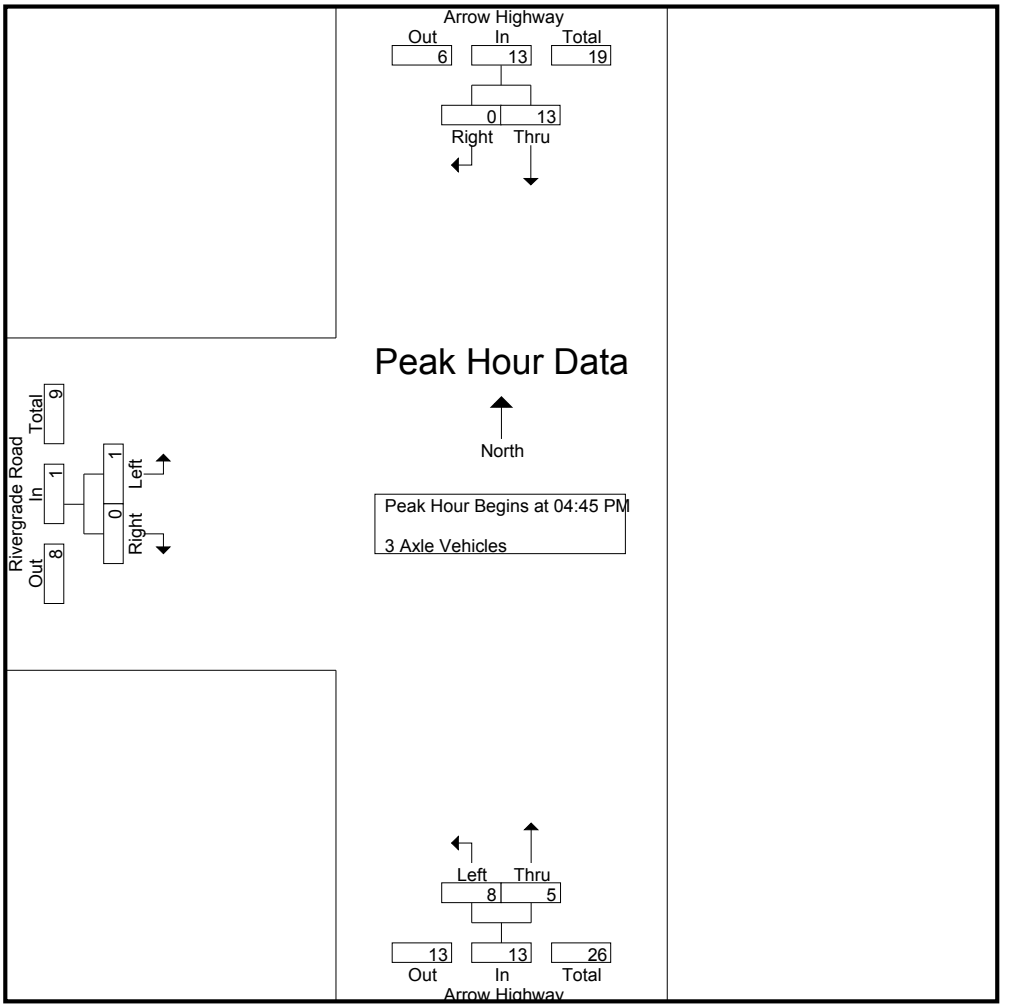
	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	5	0	5	3	0	3	0	0	0	8
04:15 PM	4	1	5	0	0	0	0	0	0	5
04:30 PM	5	1	6	2	1	3	0	1	1	10
04:45 PM	5	0	5	1	0	1	0	0	0	6
Total	19	2	21	6	1	7	0	1	1	29
05:00 PM	3	0	3	4	0	4	0	0	0	7
05:15 PM	4	0	4	0	4	4	1	0	1	9
05:30 PM	1	0	1	3	1	4	0	0	0	5
05:45 PM	1	0	1	1	0	1	0	0	0	2
Total	9	0	9	8	5	13	1	0	1	23
Grand Total	28	2	30	14	6	20	1	1	2	52
Apprch %	93.3	6.7		70	30		50	50		
Total %	53.8	3.8	57.7	26.9	11.5	38.5	1.9	1.9	3.8	

	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	**5**	0	**5**	1	0	1	0	0	0	6
05:00 PM	3	0	3	**4**	0	**4**	0	0	0	7
05:15 PM	4	0	4	0	**4**	4	**1**	0	**1**	**9**
05:30 PM	1	0	1	3	1	4	0	0	0	5
Total Volume	13	0	13	8	5	13	1	0	1	27
% App. Total	100	0		61.5	38.5		100	0		
PHF	.650	.000	.650	.500	.313	.813	.250	.000	.250	.750

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N/S: Arrow Highway
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Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	**5**	0	**5**	1	0	1	0	0	0
+15 mins.	3	0	3	**4**	0	**4**	0	0	0
+30 mins.	4	0	4	0	**4**	4	**1**	0	**1**
+45 mins.	1	0	1	3	1	4	0	0	0
Total Volume	13	0	13	8	5	13	1	0	1
% App. Total	100	0		61.5	38.5		100	0	
PHF	.650	.000	.650	.500	.313	.813	.250	.000	.250

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City of Irwindale
N/S: Arrow Highway
E/W: Rivergrade Road
Weather: Clear

File Name : IRWARRIPM
Site Code : 05114207
Start Date : 5/14/2014
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Groups Printed- 4+ Axle Trucks

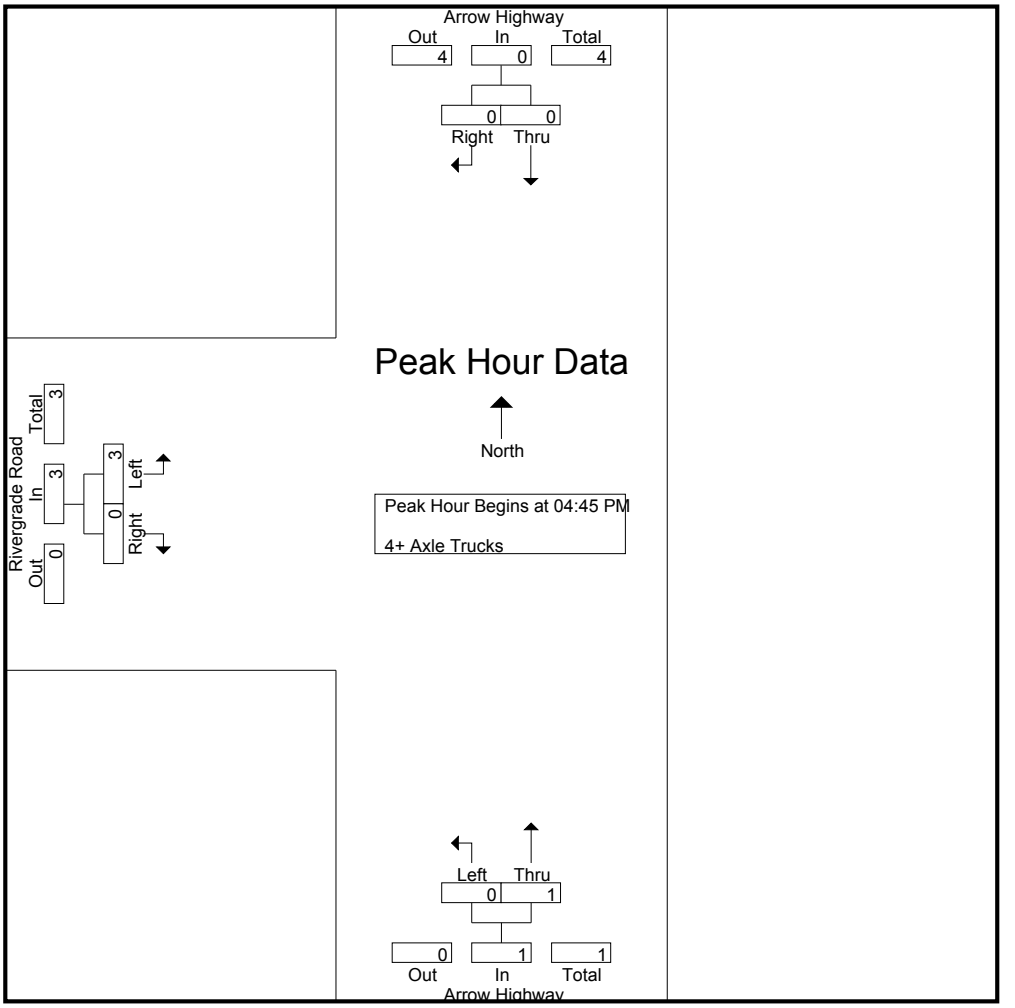
	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	1	3	4	0	2	2	0	1	1	7
04:15 PM	0	1	1	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	3	3	0	0	0	3
04:45 PM	0	0	0	0	1	1	1	0	1	2
Total	1	4	5	0	6	6	1	1	2	13
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	2	0	2	2
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	0	3	0	3	3
Grand Total	1	4	5	0	6	6	4	1	5	16
Apprch %	20	80		0	100		80	20		
Total %	6.2	25	31.2	0	37.5	37.5	25	6.2	31.2	

	Arrow Highway Southbound			Arrow Highway Northbound			Rivergrade Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	0	0	0	0	**1**	**1**	1	0	1	**2**
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	**2**	0	**2**	2
05:30 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	3	0	3	4
% App. Total	0	0		0	100		100	0		
PHF	.000	.000	.000	.000	.250	.250	.375	.000	.375	.500

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City of Irwindale
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File Name : IRWARRIPM
Site Code : 05114207
Start Date : 5/14/2014
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Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	0	0	0	0	**1**	**1**	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	**2**	0	**2**
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	3	0	3
% App. Total	0	0		0	100		100	0	
PHF	.000	.000	.000	.000	.250	.250	.375	.000	.375

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIAM
Site Code : 05116051
Start Date : 1/27/2016
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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

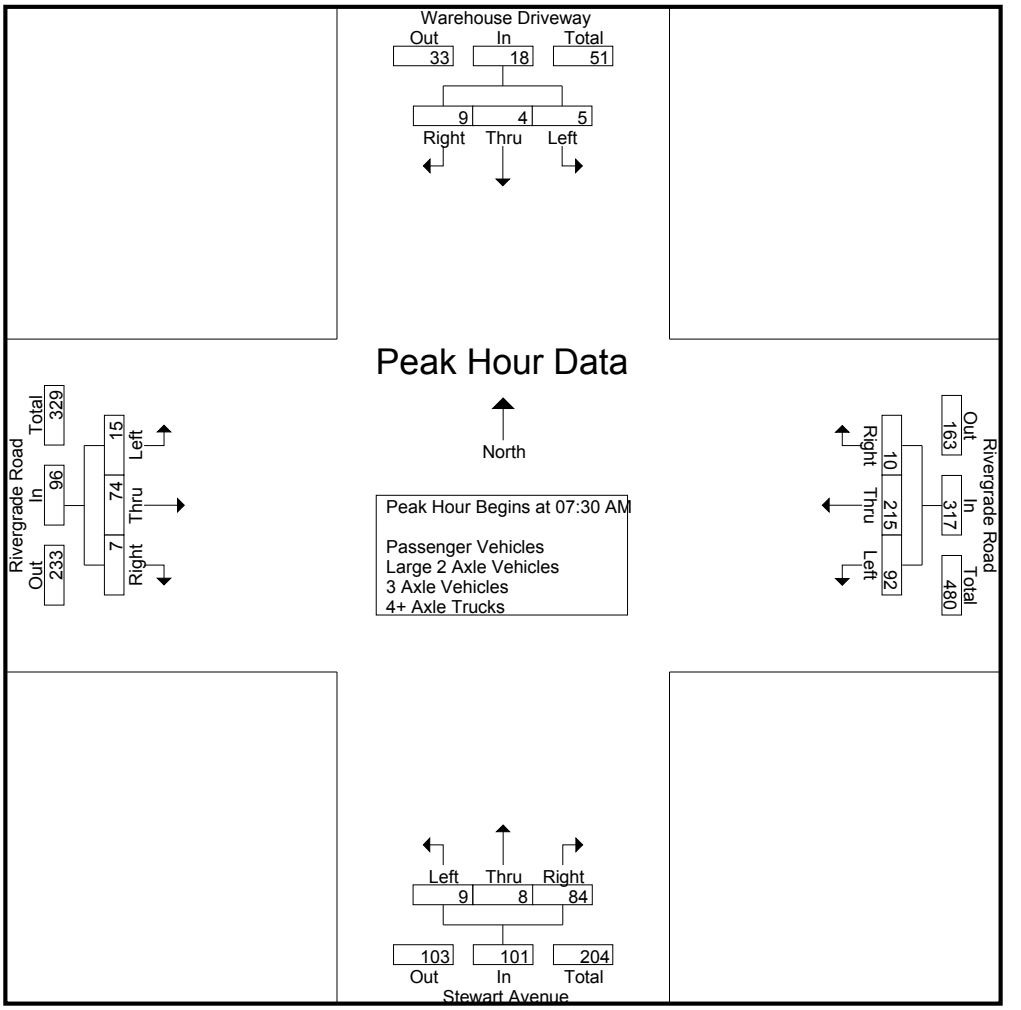
	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	1	2	3	24	23	9	56	1	5	27	33	3	20	3	26	118
07:15 AM	0	1	1	2	12	38	4	54	2	4	27	33	4	21	2	27	116
07:30 AM	4	3	2	9	10	56	1	67	1	4	24	29	4	20	1	25	130
07:45 AM	1	0	4	5	28	60	4	92	6	2	19	27	7	16	2	25	149
Total	5	5	9	19	74	177	18	269	10	15	97	122	18	77	8	103	513
08:00 AM	0	1	1	2	25	51	2	78	1	0	22	23	3	22	3	28	131
08:15 AM	0	0	2	2	29	48	3	80	1	2	19	22	1	16	1	18	122
08:30 AM	1	1	0	2	21	38	0	59	3	2	12	17	0	14	2	16	94
08:45 AM	2	1	6	9	19	52	4	75	0	4	9	13	5	21	0	26	123
Total	3	3	9	15	94	189	9	292	5	8	62	75	9	73	6	88	470
Grand Total	8	8	18	34	168	366	27	561	15	23	159	197	27	150	14	191	983
Apprch %	23.5	23.5	52.9		29.9	65.2	4.8		7.6	11.7	80.7		14.1	78.5	7.3		
Total %	0.8	0.8	1.8	3.5	17.1	37.2	2.7	57.1	1.5	2.3	16.2	20	2.7	15.3	1.4	19.4	
Passenger Vehicles	7	6	11	24	166	310	23	499	13	20	155	188	17	89	7	113	824
% Passenger Vehicles	87.5	75	61.1	70.6	98.8	84.7	85.2	88.9	86.7	87	97.5	95.4	63	59.3	50	59.2	83.8
Large 2 Axle Vehicles	0	0	3	3	1	14	1	16	2	1	2	5	3	16	4	23	47
% Large 2 Axle Vehicles	0	0	16.7	8.8	0.6	3.8	3.7	2.9	13.3	4.3	1.3	2.5	11.1	10.7	28.6	12	4.8
3 Axle Vehicles	0	0	2	2	0	7	0	7	0	0	1	1	1	25	2	28	38
% 3 Axle Vehicles	0	0	11.1	5.9	0	1.9	0	1.2	0	0	0.6	0.5	3.7	16.7	14.3	14.7	3.9
4+ Axle Trucks	1	2	2	5	1	35	3	39	0	2	1	3	6	20	1	27	74
% 4+ Axle Trucks	12.5	25	11.1	14.7	0.6	9.6	11.1	7	0	8.7	0.6	1.5	22.2	13.3	7.1	14.1	7.5

	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**4**	**3**	2	**9**	10	56	1	67	1	**4**	**24**	**29**	4	20	1	25	130
07:45 AM	1	0	**4**	5	28	**60**	**4**	**92**	**6**	2	19	27	**7**	16	2	25	**149**
08:00 AM	0	1	1	2	25	51	2	78	1	0	22	23	3	**22**	**3**	**28**	131
08:15 AM	0	0	2	2	**29**	48	3	80	1	2	19	22	1	16	1	18	122
Total Volume	5	4	9	18	92	215	10	317	9	8	84	101	15	74	7	96	532
% App. Total	27.8	22.2	50		29	67.8	3.2		8.9	7.9	83.2		15.6	77.1	7.3		
PHF	.313	.333	.563	.500	.793	.896	.625	.861	.375	.500	.875	.871	.536	.841	.583	.857	.893

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City of Irwindale
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E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIAM
Site Code : 05116051
Start Date : 1/27/2016
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				07:00 AM				07:15 AM			
+0 mins.	0	1	2	3	10	56	1	67	1	**5**	**27**	**33**	4	21	2	27
+15 mins.	0	1	1	2	28	**60**	**4**	**92**	2	4	27	33	4	20	1	25
+30 mins.	**4**	**3**	2	**9**	25	51	2	78	1	4	24	29	**7**	16	2	25
+45 mins.	1	0	**4**	5	**29**	48	3	80	**6**	2	19	27	3	**22**	**3**	**28**
Total Volume	5	5	9	19	92	215	10	317	10	15	97	122	18	79	8	105
% App. Total	26.3	26.3	47.4		29	67.8	3.2		8.2	12.3	79.5		17.1	75.2	7.6	
PHF	.313	.417	.563	.528	.793	.896	.625	.861	.417	.750	.898	.924	.643	.898	.667	.938

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles

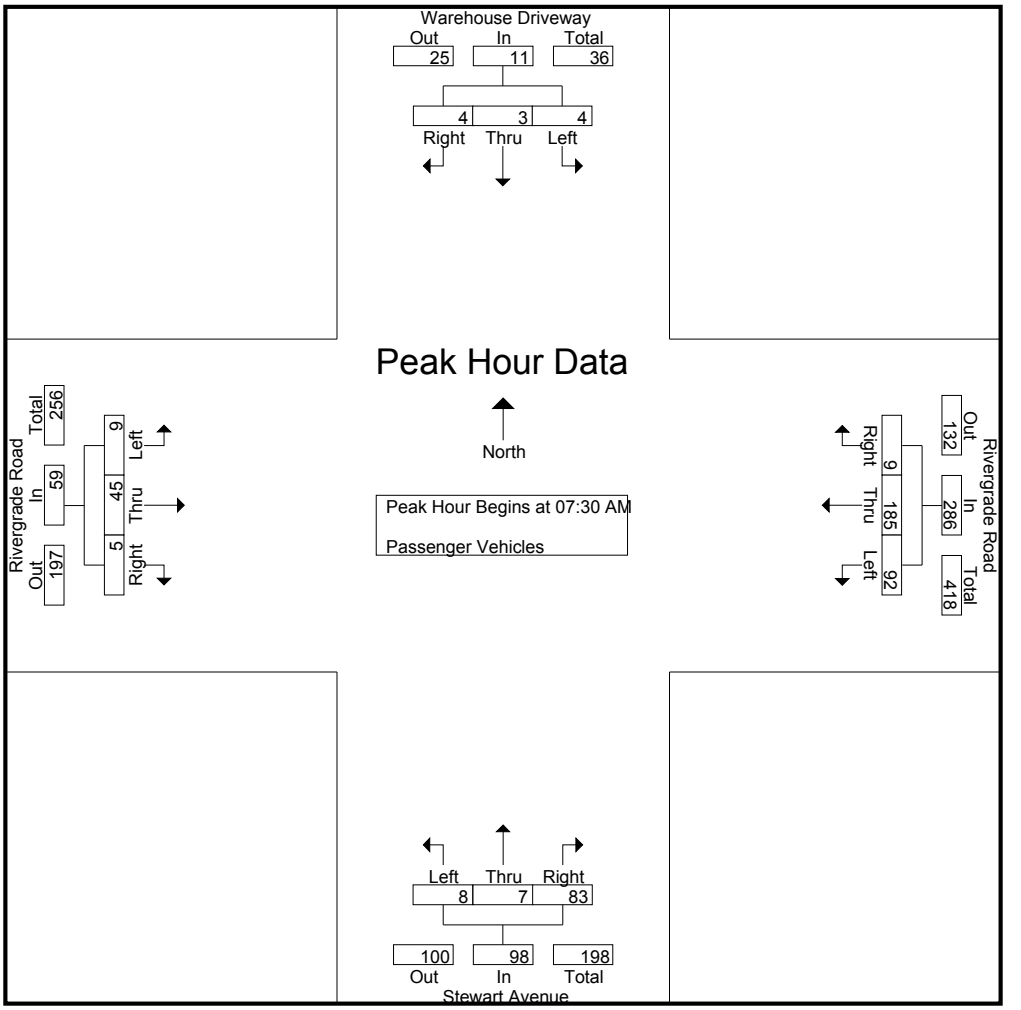
	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	1	2	3	23	18	9	50	1	3	26	30	3	9	0	12	95
07:15 AM	0	1	0	1	11	33	4	48	1	4	27	32	3	17	0	20	101
07:30 AM	4	3	1	8	10	52	1	63	1	4	24	29	4	11	1	16	116
07:45 AM	0	0	1	1	28	52	4	84	5	2	19	26	4	10	1	15	126
Total	4	5	4	13	72	155	18	245	8	13	96	117	14	47	2	63	438
08:00 AM	0	0	1	1	25	39	1	65	1	0	21	22	1	15	2	18	106
08:15 AM	0	0	1	1	29	42	3	74	1	1	19	21	0	9	1	10	106
08:30 AM	1	1	0	2	21	31	0	52	3	2	10	15	0	6	2	8	77
08:45 AM	2	0	5	7	19	43	1	63	0	4	9	13	2	12	0	14	97
Total	3	1	7	11	94	155	5	254	5	7	59	71	3	42	5	50	386
Grand Total	7	6	11	24	166	310	23	499	13	20	155	188	17	89	7	113	824
Apprch %	29.2	25	45.8		33.3	62.1	4.6		6.9	10.6	82.4		15	78.8	6.2		
Total %	0.8	0.7	1.3	2.9	20.1	37.6	2.8	60.6	1.6	2.4	18.8	22.8	2.1	10.8	0.8	13.7	

	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**4**	**3**	**1**	**8**	10	**52**	1	63	1	**4**	**24**	**29**	**4**	11	1	16	116
07:45 AM	0	0	1	1	28	52	**4**	**84**	**5**	2	19	26	4	10	1	15	**126**
08:00 AM	0	0	1	1	25	39	1	65	1	0	21	22	1	**15**	**2**	**18**	106
08:15 AM	0	0	1	1	**29**	42	3	74	1	1	19	21	0	9	1	10	106
Total Volume	4	3	4	11	92	185	9	286	8	7	83	98	9	45	5	59	454
% App. Total	36.4	27.3	36.4		32.2	64.7	3.1		8.2	7.1	84.7		15.3	76.3	8.5		
PHF	.250	.250	1.00	.344	.793	.889	.563	.851	.400	.438	.865	.845	.563	.750	.625	.819	.901

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIAM
Site Code : 05116051
Start Date : 1/27/2016
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	**4**	**3**	**1**	**8**	10	**52**	1	63	1	**4**	**24**	**29**	**4**	11	1	16
+15 mins.	0	0	1	1	28	52	**4**	**84**	**5**	2	19	26	4	10	1	15
+30 mins.	0	0	1	1	25	39	1	65	1	0	21	22	1	**15**	**2**	**18**
+45 mins.	0	0	1	1	**29**	42	3	74	1	1	19	21	0	9	1	10
Total Volume	4	3	4	11	92	185	9	286	8	7	83	98	9	45	5	59
% App. Total	36.4	27.3	36.4		32.2	64.7	3.1		8.2	7.1	84.7		15.3	76.3	8.5	
PHF	.250	.250	1.000	.344	.793	.889	.563	.851	.400	.438	.865	.845	.563	.750	.625	.819

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Large 2 Axle Vehicles

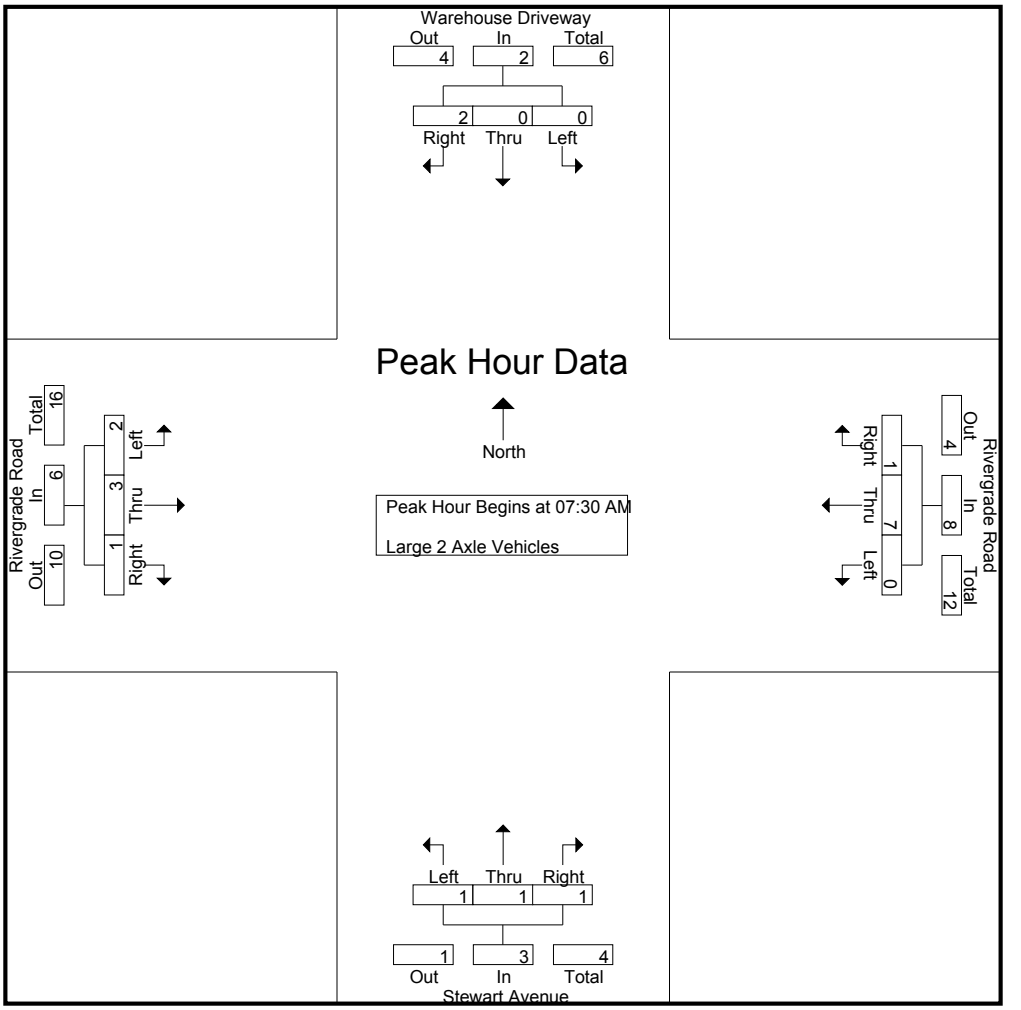
	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	1	1	0	2	0	0	0	0	0	5	1	6	8
07:15 AM	0	0	0	0	0	2	0	2	1	0	0	1	0	1	2	3	6
07:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	2	3
07:45 AM	0	0	1	1	0	2	0	2	1	0	0	1	1	0	1	2	6
Total	0	0	1	1	1	6	0	7	2	0	0	2	1	8	4	13	23
08:00 AM	0	0	0	0	0	2	1	3	0	0	1	1	1	1	0	2	6
08:15 AM	0	0	1	1	0	2	0	2	0	1	0	1	0	0	0	0	4
08:30 AM	0	0	0	0	0	1	0	1	0	0	1	1	0	4	0	4	6
08:45 AM	0	0	1	1	0	3	0	3	0	0	0	0	1	3	0	4	8
Total	0	0	2	2	0	8	1	9	0	1	2	3	2	8	0	10	24
Grand Total	0	0	3	3	1	14	1	16	2	1	2	5	3	16	4	23	47
Apprch %	0	0	100		6.2	87.5	6.2		40	20	40		13	69.6	17.4		
Total %	0	0	6.4	6.4	2.1	29.8	2.1	34	4.3	2.1	4.3	10.6	6.4	34	8.5	48.9	

	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	**2**	0	**2**	3
07:45 AM	0	0	**1**	**1**	0	**2**	0	2	**1**	0	0	**1**	**1**	0	**1**	2	**6**
08:00 AM	0	0	0	0	0	2	**1**	**3**	0	0	**1**	1	1	1	0	2	6
08:15 AM	0	0	1	1	0	2	0	2	0	**1**	0	1	0	0	0	0	4
Total Volume	0	0	2	2	0	7	1	8	1	1	1	3	2	3	1	6	19
% App. Total	0	0	100		0	87.5	12.5		33.3	33.3	33.3		33.3	50	16.7		
PHF	.000	.000	.500	.500	.000	.875	.250	.667	.250	.250	.250	.750	.500	.375	.250	.750	.792

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City of Irwindale
N/S: Stewart Avenue
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File Name : IRWSTRIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	**2**	0	**2**
+15 mins.	0	0	**1**	**1**	0	**2**	0	2	**1**	0	0	**1**	**1**	0	**1**	2
+30 mins.	0	0	0	0	0	2	**1**	**3**	0	0	**1**	1	1	1	0	2
+45 mins.	0	0	1	1	0	2	0	2	0	**1**	0	1	0	0	0	0
Total Volume	0	0	2	2	0	7	1	8	1	1	1	3	2	3	1	6
% App. Total	0	0	100		0	87.5	12.5		33.3	33.3	33.3		33.3	50	16.7	
PHF	.000	.000	.500	.500	.000	.875	.250	.667	.250	.250	.250	.750	.500	.375	.250	.750

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 3 Axle Vehicles

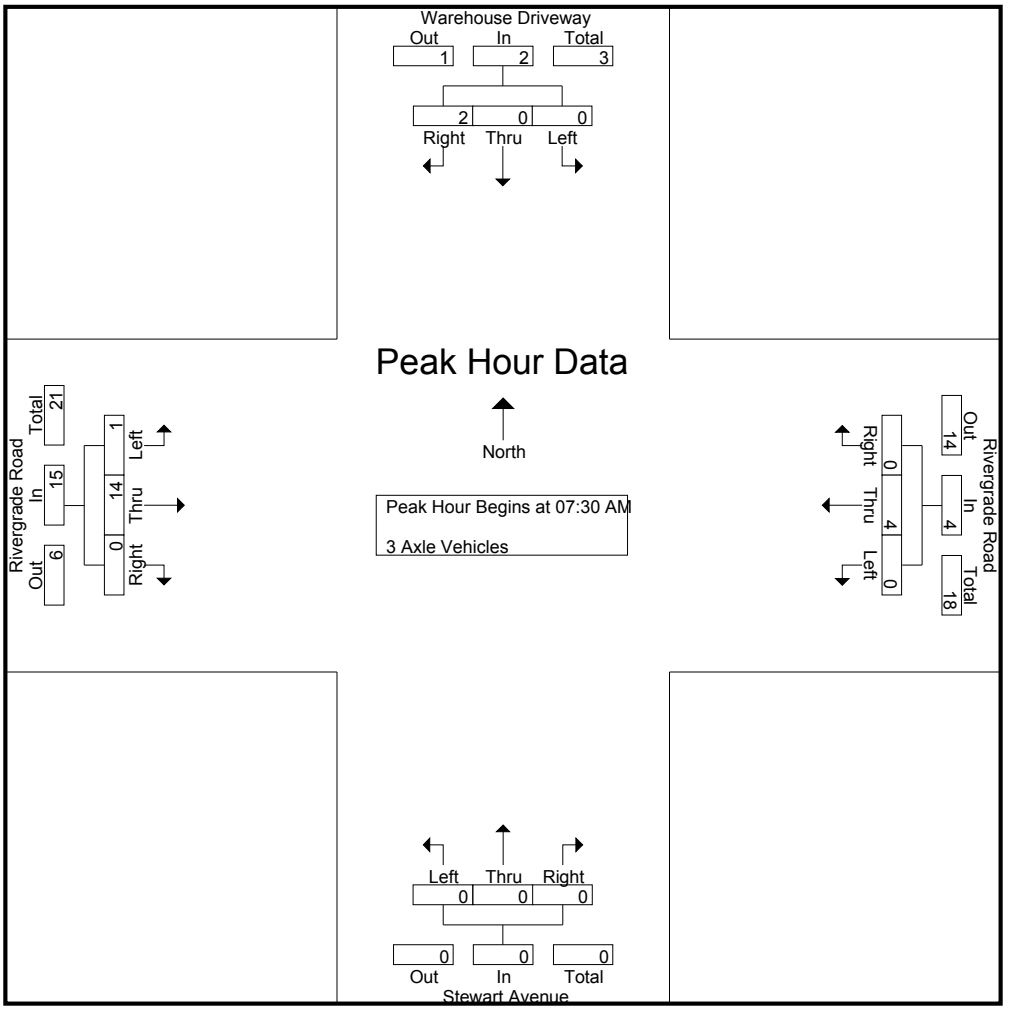
	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	1	0	1	0	0	1	1	0	4	2	6	8
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	3	4
07:30 AM	0	0	1	1	0	2	0	2	0	0	0	0	0	6	0	6	9
07:45 AM	0	0	1	1	0	2	0	2	0	0	0	0	1	2	0	3	6
Total	0	0	2	2	0	6	0	6	0	0	1	1	1	15	2	18	27
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	4
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
08:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	2	3
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	10	0	10	11
Grand Total	0	0	2	2	0	7	0	7	0	0	1	1	1	25	2	28	38
Apprch %	0	0	100		0	100	0		0	0	100		3.6	89.3	7.1		
Total %	0	0	5.3	5.3	0	18.4	0	18.4	0	0	2.6	2.6	2.6	65.8	5.3	73.7	

	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	**1**	**1**	0	**2**	0	**2**	0	0	0	0	0	**6**	0	**6**	**9**
07:45 AM	0	0	1	1	0	2	0	2	0	0	0	0	**1**	2	0	3	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	4
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total Volume	0	0	2	2	0	4	0	4	0	0	0	0	1	14	0	15	21
% App. Total	0	0	100		0	100	0		0	0	0		6.7	93.3	0		
PHF	.000	.000	.500	.500	.000	.500	.000	.500	.000	.000	.000	.000	.250	.583	.000	.625	.583

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City of Irwindale
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Weather: Clear

File Name : IRWSTRIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	**1**	**1**	0	**2**	0	**2**	0	0	0	0	0	**6**	0	**6**
+15 mins.	0	0	1	1	0	2	0	2	0	0	0	0	**1**	2	0	3
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Total Volume	0	0	2	2	0	4	0	4	0	0	0	0	1	14	0	15
% App. Total	0	0	100		0	100	0		0	0	0		6.7	93.3	0	
PHF	.000	.000	.500	.500	.000	.500	.000	.500	.000	.000	.000	.000	.250	.583	.000	.625

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 4+ Axle Trucks

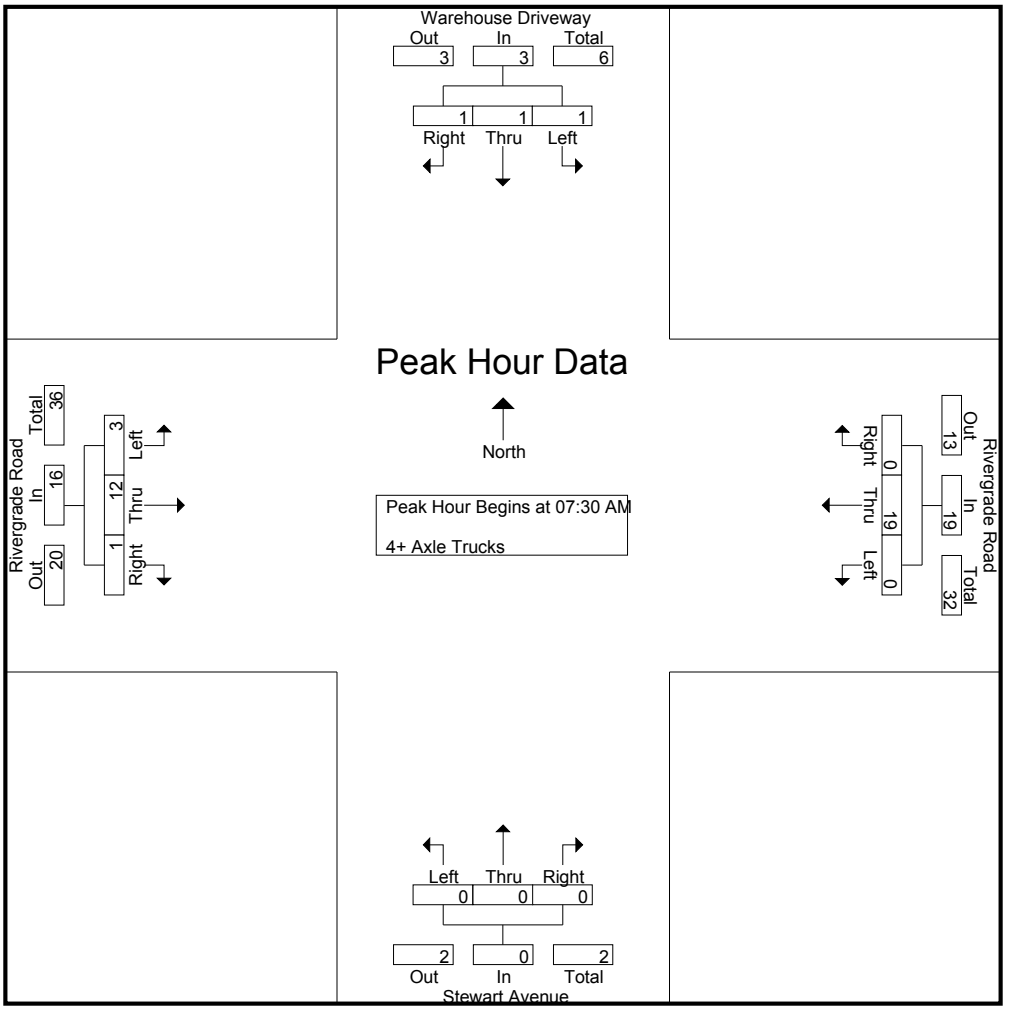
	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	3	0	3	0	2	0	2	0	2	0	2	7
07:15 AM	0	0	1	1	1	2	0	3	0	0	0	0	1	0	0	1	5
07:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
07:45 AM	1	0	1	2	0	4	0	4	0	0	0	0	1	4	0	5	11
Total	1	0	2	3	1	10	0	11	0	2	0	2	2	7	0	9	25
08:00 AM	0	1	0	1	0	10	0	10	0	0	0	0	1	2	1	4	15
08:15 AM	0	0	0	0	0	4	0	4	0	0	0	0	1	5	0	6	10
08:30 AM	0	0	0	0	0	5	0	5	0	0	1	1	0	2	0	2	8
08:45 AM	0	1	0	1	0	6	3	9	0	0	0	0	2	4	0	6	16
Total	0	2	0	2	0	25	3	28	0	0	1	1	4	13	1	18	49
Grand Total	1	2	2	5	1	35	3	39	0	2	1	3	6	20	1	27	74
Apprch %	20	40	40		2.6	89.7	7.7		0	66.7	33.3		22.2	74.1	3.7		
Total %	1.4	2.7	2.7	6.8	1.4	47.3	4.1	52.7	0	2.7	1.4	4.1	8.1	27	1.4	36.5	

	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
07:45 AM	**1**	0	**1**	**2**	0	4	0	4	0	0	0	0	**1**	4	0	5	11
08:00 AM	0	**1**	0	1	0	**10**	0	**10**	0	0	0	0	1	2	**1**	4	**15**
08:15 AM	0	0	0	0	0	4	0	4	0	0	0	0	1	**5**	0	**6**	10
Total Volume	1	1	1	3	0	19	0	19	0	0	0	0	3	12	1	16	38
% App. Total	33.3	33.3	33.3		0	100	0		0	0	0		18.8	75	6.2		
PHF	.250	.250	.250	.375	.000	.475	.000	.475	.000	.000	.000	.000	.750	.600	.250	.667	.633

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIAM
Site Code : 05116051
Start Date : 1/27/2016
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
+15 mins.	**1**	0	**1**	**2**	0	4	0	4	0	0	0	0	**1**	4	0	5
+30 mins.	0	**1**	0	1	0	**10**	0	**10**	0	0	0	0	1	2	**1**	4
+45 mins.	0	0	0	0	0	4	0	4	0	0	0	0	1	**5**	0	**6**
Total Volume	1	1	1	3	0	19	0	19	0	0	0	0	3	12	1	16
% App. Total	33.3	33.3	33.3		0	100	0		0	0	0		18.8	75	6.2	
PHF	.250	.250	.250	.375	.000	.475	.000	.475	.000	.000	.000	.000	.750	.600	.250	.667

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

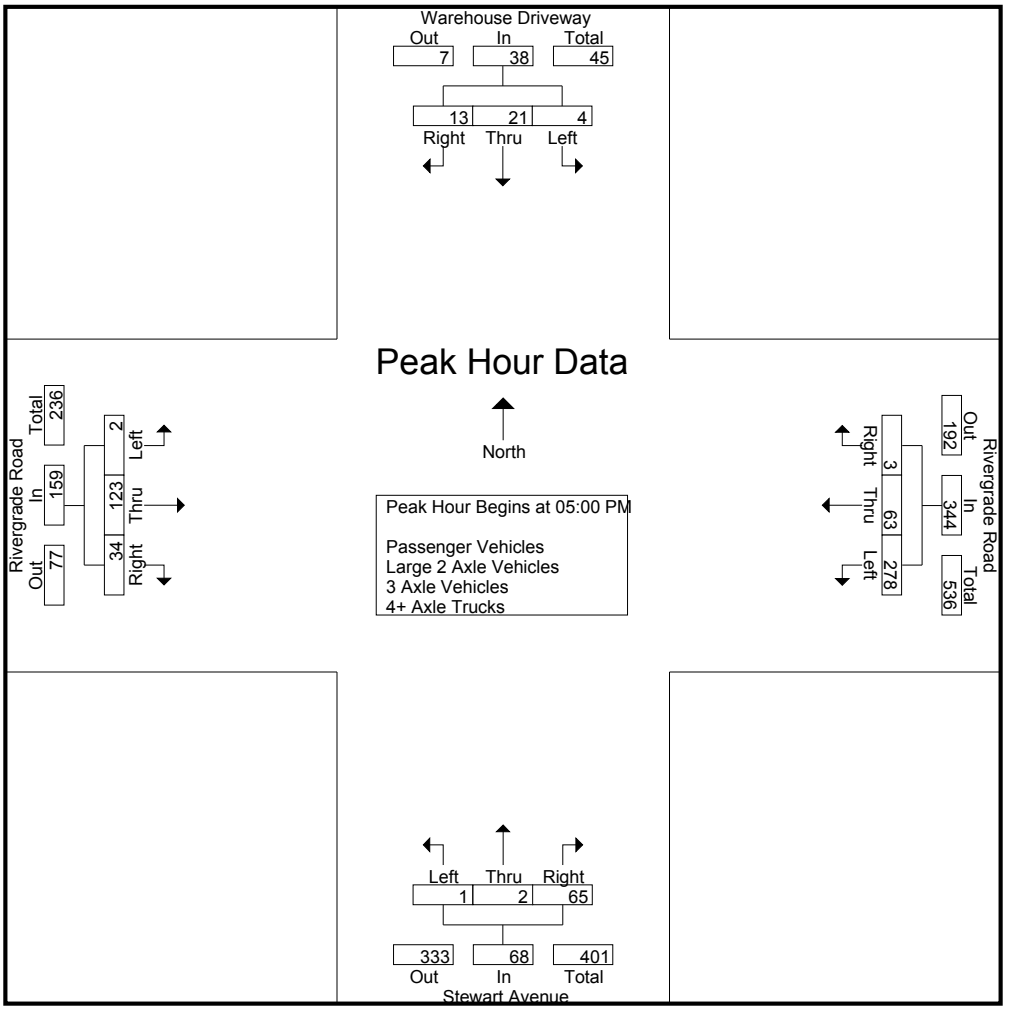
	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	4	12	12	28	22	18	0	40	1	0	12	13	3	23	4	30	111
04:15 PM	4	7	7	18	22	16	0	38	1	3	11	15	4	13	4	21	92
04:30 PM	5	10	4	19	30	11	1	42	1	1	16	18	3	27	0	30	109
04:45 PM	2	1	3	6	32	9	0	41	2	0	20	22	0	22	2	24	93
Total	15	30	26	71	106	54	1	161	5	4	59	68	10	85	10	105	405
05:00 PM	0	2	1	3	24	18	2	44	0	1	15	16	0	36	14	50	113
05:15 PM	2	1	2	5	101	23	0	124	1	1	18	20	1	38	6	45	194
05:30 PM	2	15	8	25	110	14	0	124	0	0	14	14	1	25	9	35	198
05:45 PM	0	3	2	5	43	8	1	52	0	0	18	18	0	24	5	29	104
Total	4	21	13	38	278	63	3	344	1	2	65	68	2	123	34	159	609
Grand Total	19	51	39	109	384	117	4	505	6	6	124	136	12	208	44	264	1014
Apprch %	17.4	46.8	35.8		76	23.2	0.8		4.4	4.4	91.2		4.5	78.8	16.7		
Total %	1.9	5	3.8	10.7	37.9	11.5	0.4	49.8	0.6	0.6	12.2	13.4	1.2	20.5	4.3	26	
Passenger Vehicles	18	49	36	103	357	102	3	462	5	5	124	134	9	195	37	241	940
% Passenger Vehicles	94.7	96.1	92.3	94.5	93	87.2	75	91.5	83.3	83.3	100	98.5	75	93.8	84.1	91.3	92.7
Large 2 Axle Vehicles	0	2	0	2	2	9	1	12	1	0	0	1	1	6	2	9	24
% Large 2 Axle Vehicles	0	3.9	0	1.8	0.5	7.7	25	2.4	16.7	0	0	0.7	8.3	2.9	4.5	3.4	2.4
3 Axle Vehicles	0	0	0	0	25	1	0	26	0	0	0	0	0	3	4	7	33
% 3 Axle Vehicles	0	0	0	0	6.5	0.9	0	5.1	0	0	0	0	0	1.4	9.1	2.7	3.3
4+ Axle Trucks	1	0	3	4	0	5	0	5	0	1	0	1	2	4	1	7	17
% 4+ Axle Trucks	5.3	0	7.7	3.7	0	4.3	0	1	0	16.7	0	0.7	16.7	1.9	2.3	2.7	1.7

	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	2	1	3	24	18	**2**	44	0	**1**	15	16	0	36	**14**	**50**	113
05:15 PM	**2**	1	2	5	101	**23**	0	**124**	**1**	1	**18**	**20**	**1**	**38**	6	45	194
05:30 PM	2	**15**	**8**	**25**	**110**	14	0	124	0	0	14	14	1	25	9	35	**198**
05:45 PM	0	3	2	5	43	8	1	52	0	0	18	18	0	24	5	29	104
Total Volume	4	21	13	38	278	63	3	344	1	2	65	68	2	123	34	159	609
% App. Total	10.5	55.3	34.2		80.8	18.3	0.9		1.5	2.9	95.6		1.3	77.4	21.4		
PHF	.500	.350	.406	.380	.632	.685	.375	.694	.250	.500	.903	.850	.500	.809	.607	.795	.769

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Weather: Clear

File Name : IRWSTRIPM
Site Code : 05116051
Start Date : 1/27/2016
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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:30 PM				05:00 PM			
+0 mins.	4	**12**	**12**	**28**	24	18	**2**	44	1	**1**	16	18	0	36	**14**	**50**
+15 mins.	4	7	7	18	101	**23**	0	**124**	**2**	0	**20**	**22**	**1**	**38**	6	45
+30 mins.	**5**	10	4	19	**110**	14	0	124	0	1	15	16	1	25	9	35
+45 mins.	2	1	3	6	43	8	1	52	1	1	18	20	0	24	5	29
Total Volume	15	30	26	71	278	63	3	344	4	3	69	76	2	123	34	159
% App. Total	21.1	42.3	36.6		80.8	18.3	0.9		5.3	3.9	90.8		1.3	77.4	21.4	
PHF	.750	.625	.542	.634	.632	.685	.375	.694	.500	.750	.863	.864	.500	.809	.607	.795

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIPM
Site Code : 05116051
Start Date : 1/27/2016
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Groups Printed- Passenger Vehicles

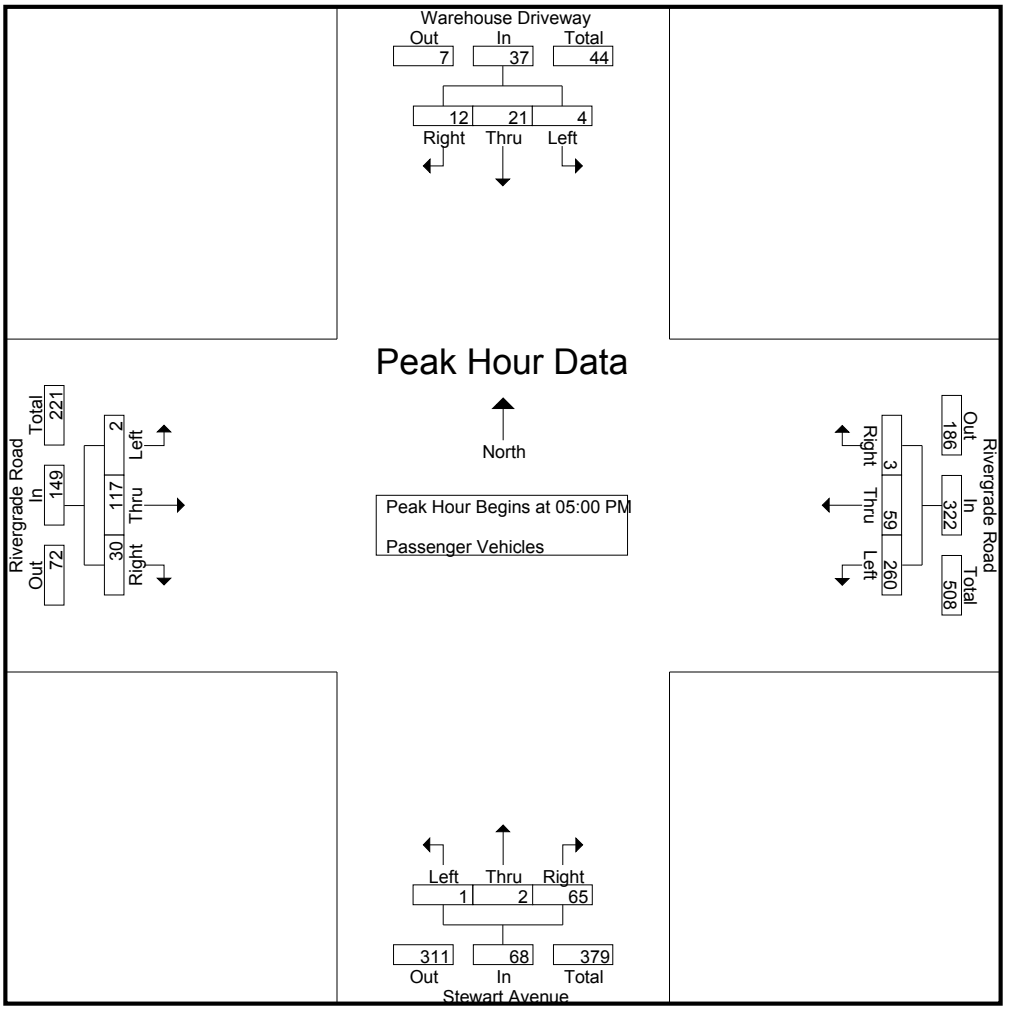
	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	4	11	12	27	19	13	0	32	1	0	12	13	2	21	4	27	99
04:15 PM	4	7	6	17	21	11	0	32	0	2	11	13	4	12	2	18	80
04:30 PM	4	10	4	18	26	10	0	36	1	1	16	18	1	24	0	25	97
04:45 PM	2	0	2	4	31	9	0	40	2	0	20	22	0	21	1	22	88
Total	14	28	24	66	97	43	0	140	4	3	59	66	7	78	7	92	364
05:00 PM	0	2	0	2	21	16	2	39	0	1	15	16	0	35	13	48	105
05:15 PM	2	1	2	5	95	23	0	118	1	1	18	20	1	38	5	44	187
05:30 PM	2	15	8	25	105	13	0	118	0	0	14	14	1	22	8	31	188
05:45 PM	0	3	2	5	39	7	1	47	0	0	18	18	0	22	4	26	96
Total	4	21	12	37	260	59	3	322	1	2	65	68	2	117	30	149	576
Grand Total	18	49	36	103	357	102	3	462	5	5	124	134	9	195	37	241	940
Apprch %	17.5	47.6	35		77.3	22.1	0.6		3.7	3.7	92.5		3.7	80.9	15.4		
Total %	1.9	5.2	3.8	11	38	10.9	0.3	49.1	0.5	0.5	13.2	14.3	1	20.7	3.9	25.6	

	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	2	0	2	21	16	**2**	39	0	**1**	15	16	0	35	**13**	**48**	105
05:15 PM	**2**	1	2	5	95	**23**	0	**118**	**1**	1	**18**	**20**	**1**	**38**	5	44	187
05:30 PM	2	**15**	**8**	**25**	**105**	13	0	118	0	0	14	14	1	22	8	31	**188**
05:45 PM	0	3	2	5	39	7	1	47	0	0	18	18	0	22	4	26	96
Total Volume	4	21	12	37	260	59	3	322	1	2	65	68	2	117	30	149	576
% App. Total	10.8	56.8	32.4		80.7	18.3	0.9		1.5	2.9	95.6		1.3	78.5	20.1		
PHF	.500	.350	.375	.370	.619	.641	.375	.682	.250	.500	.903	.850	.500	.770	.577	.776	.766

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	2	0	2	21	16	**2**	39	0	**1**	15	16	0	35	**13**	**48**
+15 mins.	**2**	1	2	5	95	**23**	0	**118**	**1**	1	**18**	**20**	**1**	**38**	5	44
+30 mins.	2	**15**	**8**	**25**	**105**	13	0	118	0	0	14	14	1	22	8	31
+45 mins.	0	3	2	5	39	7	1	47	0	0	18	18	0	22	4	26
Total Volume	4	21	12	37	260	59	3	322	1	2	65	68	2	117	30	149
% App. Total	10.8	56.8	32.4		80.7	18.3	0.9		1.5	2.9	95.6		1.3	78.5	20.1	
PHF	.500	.350	.375	.370	.619	.641	.375	.682	.250	.500	.903	.850	.500	.770	.577	.776

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Large 2 Axle Vehicles

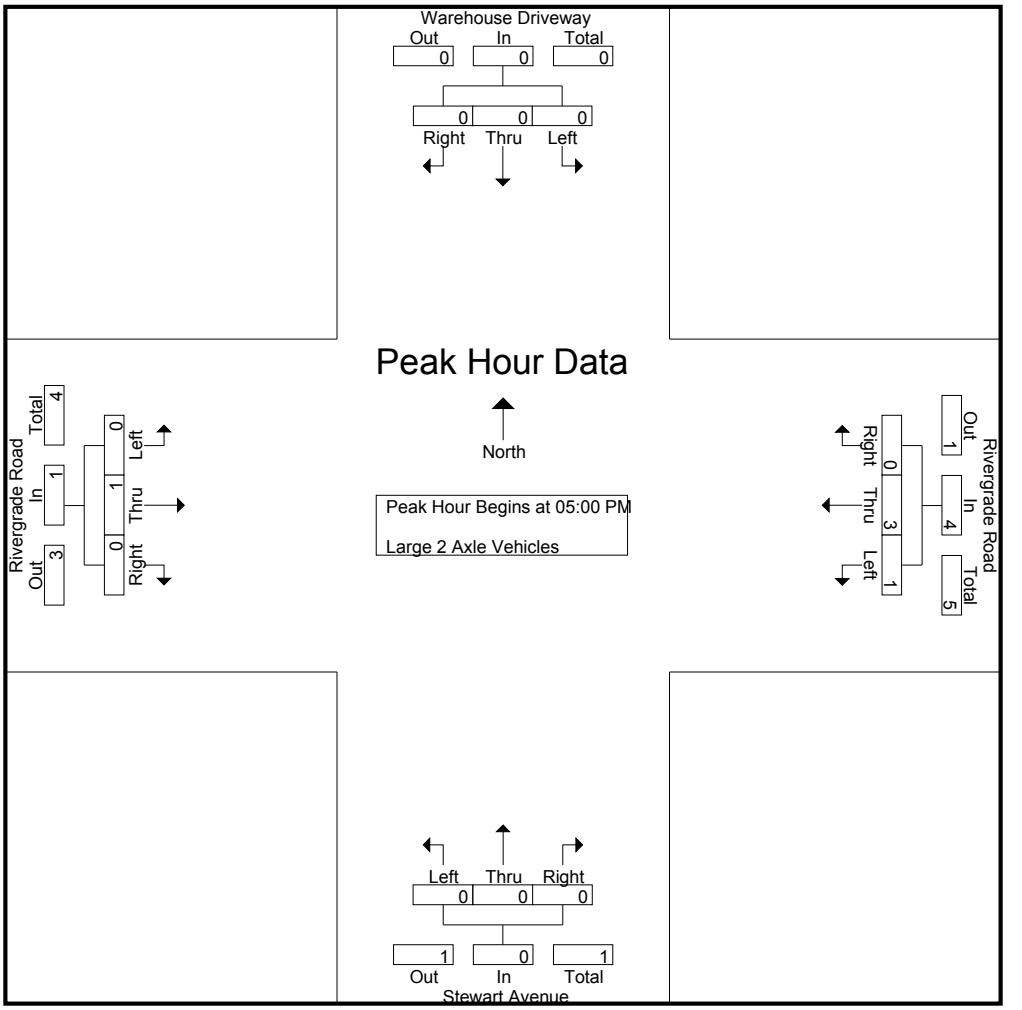
	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	1	0	1	0	2	0	2	0	0	0	0	1	2	0	3	6
04:15 PM	0	0	0	0	0	3	0	3	1	0	0	1	0	1	1	2	6
04:30 PM	0	0	0	0	1	1	1	3	0	0	0	0	0	2	0	2	5
04:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	2
Total	0	2	0	2	1	6	1	8	1	0	0	1	1	5	2	8	19
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
05:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	1	3	0	4	0	0	0	0	0	1	0	1	5
Grand Total	0	2	0	2	2	9	1	12	1	0	0	1	1	6	2	9	24
Apprch %	0	100	0		16.7	75	8.3		100	0	0		11.1	66.7	22.2		
Total %	0	8.3	0	8.3	8.3	37.5	4.2	50	4.2	0	0	4.2	4.2	25	8.3	37.5	

	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	**1**	0	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	**1**	0	**1**	**2**
05:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	1	3	0	4	0	0	0	0	0	1	0	1	5
% App. Total	0	0	0		25	75	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.250	.750	.000	1.00	.000	.000	.000	.000	.000	.250	.000	.250	.625

Counts Unlimited
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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	**1**	0	0	1	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	**1**	0	**1**
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	3	0	4	0	0	0	0	0	1	0	1
% App. Total	0	0	0		25	75	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.250	.750	.000	1.000	.000	.000	.000	.000	.000	.250	.000	.250

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 3 Axle Vehicles

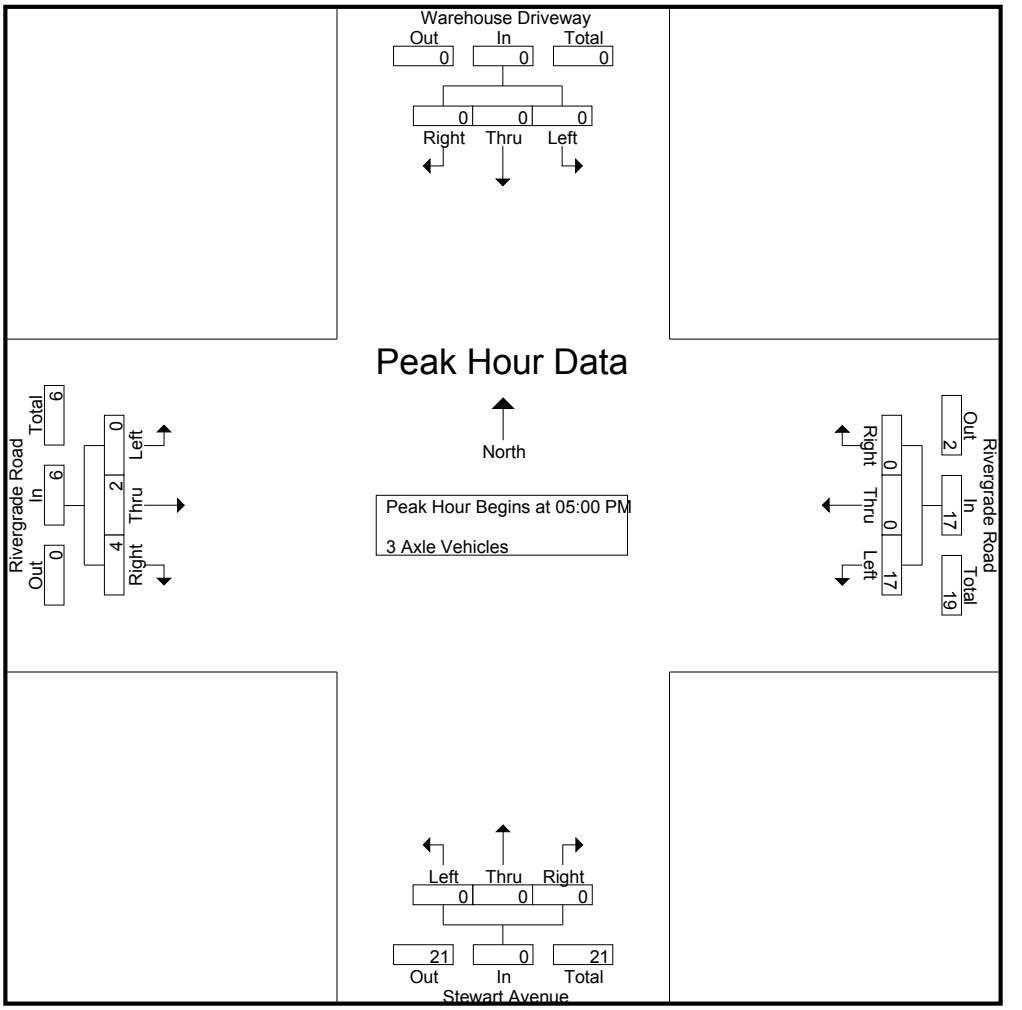
	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	3	1	0	4	0	0	0	0	0	0	0	0	4
04:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	3
04:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
Total	0	0	0	0	8	1	0	9	0	0	0	0	0	1	0	1	10
05:00 PM	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	1	4
05:15 PM	0	0	0	0	5	0	0	5	0	0	0	0	0	0	1	1	6
05:30 PM	0	0	0	0	5	0	0	5	0	0	0	0	0	2	1	3	8
05:45 PM	0	0	0	0	4	0	0	4	0	0	0	0	0	0	1	1	5
Total	0	0	0	0	17	0	0	17	0	0	0	0	0	2	4	6	23
Grand Total	0	0	0	0	25	1	0	26	0	0	0	0	0	3	4	7	33
Apprch %	0	0	0		96.2	3.8	0		0	0	0		0	42.9	57.1		
Total %	0	0	0	0	75.8	3	0	78.8	0	0	0	0	0	9.1	12.1	21.2	

	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	3	0	0	3	0	0	0	0	0	0	**1**	1	4
05:15 PM	0	0	0	0	**5**	0	0	**5**	0	0	0	0	0	0	1	1	6
05:30 PM	0	0	0	0	5	0	0	5	0	0	0	0	0	**2**	1	**3**	**8**
05:45 PM	0	0	0	0	4	0	0	4	0	0	0	0	0	0	1	1	5
Total Volume	0	0	0	0	17	0	0	17	0	0	0	0	0	2	4	6	23
% App. Total	0	0	0		100	0	0		0	0	0		0	33.3	66.7		
PHF	.000	.000	.000	.000	.850	.000	.000	.850	.000	.000	.000	.000	.000	.250	1.00	.500	.719

Counts Unlimited
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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	3	0	0	3	0	0	0	0	0	0	**1**	1
+15 mins.	0	0	0	0	**5**	0	0	**5**	0	0	0	0	0	0	1	1
+30 mins.	0	0	0	0	5	0	0	5	0	0	0	0	0	**2**	1	**3**
+45 mins.	0	0	0	0	4	0	0	4	0	0	0	0	0	0	1	1
Total Volume	0	0	0	0	17	0	0	17	0	0	0	0	0	2	4	6
% App. Total	0	0	0		100	0	0		0	0	0		0	33.3	66.7	
PHF	.000	.000	.000	.000	.850	.000	.000	.850	.000	.000	.000	.000	.000	.250	1.000	.500

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City of Irwindale
N/S: Stewart Avenue
E/W: Rivergrade Road
Weather: Clear

File Name : IRWSTRIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 4+ Axle Trucks

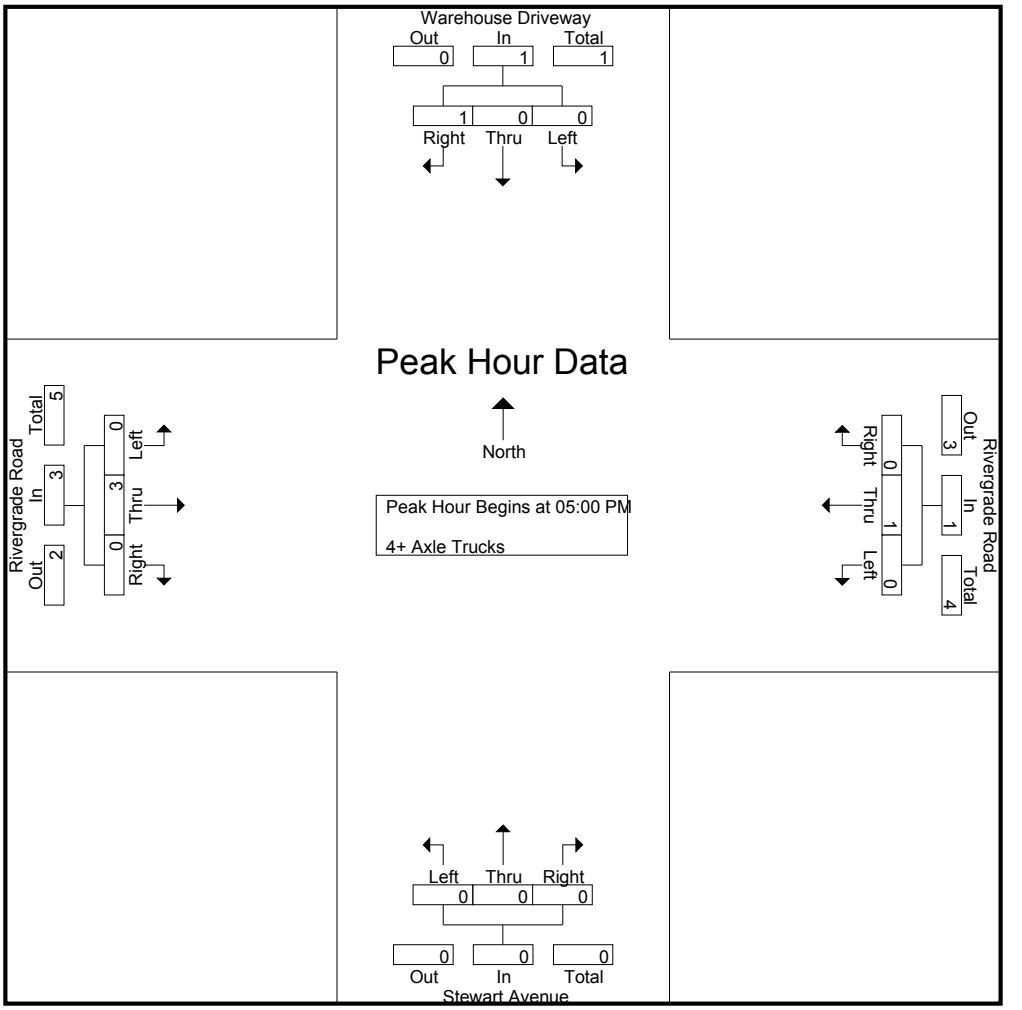
	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	1	1	0	2	0	2	0	1	0	1	0	0	1	1	5
04:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	2	1	0	3	4
04:45 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	0	2	3	0	4	0	4	0	1	0	1	2	1	1	4	12
05:00 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	1	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	0	0	1	1	0	1	0	1	0	0	0	0	0	3	0	3	5
Grand Total	1	0	3	4	0	5	0	5	0	1	0	1	2	4	1	7	17
Apprch %	25	0	75		0	100	0		0	100	0		28.6	57.1	14.3		
Total %	5.9	0	17.6	23.5	0	29.4	0	29.4	0	5.9	0	5.9	11.8	23.5	5.9	41.2	

	Warehouse Driveway Southbound				Rivergrade Road Westbound				Stewart Avenue Northbound				Rivergrade Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	**1**	**1**	0	**1**	0	**1**	0	0	0	0	0	1	0	1	**3**
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	2
Total Volume	0	0	1	1	0	1	0	1	0	0	0	0	0	3	0	3	5
% App. Total	0	0	100		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.250	.250	.000	.250	.000	.250	.000	.000	.000	.000	.000	.375	.000	.375	.417

Counts Unlimited
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City of Irwindale
N/S: Stewart Avenue
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File Name : IRWSTRIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	**1**	**1**	0	**1**	0	**1**	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**
Total Volume	0	0	1	1	0	1	0	1	0	0	0	0	0	3	0	3
% App. Total	0	0	100		0	100	0		0	0	0		0	100	0	
PHF	.000	.000	.250	.250	.000	.250	.000	.250	.000	.000	.000	.000	.000	.375	.000	.375

Existing (2016) PCE Conversion

2016/02/29

6. Stewart Av. / Rivergrade Rd.

	AM PEAK HOUR												AM TOTAL	PM PEAK HOUR											PM TOTAL
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
Existing (2016)																										
- Passenger Vehicles	8	7	83	4	3	4	9	45	5	92	185	9	454	1	2	65	4	21	12	2	117	30	260	59	3	576
- 2-Axle Trucks	1	1	1	0	0	2	2	3	1	0	7	1	19	0	0	0	0	0	0	0	1	0	1	3	0	5
- 3-Axle Trucks	0	0	0	0	0	2	1	14	0	0	4	0	21	0	0	0	0	0	0	0	2	4	17	0	0	23
- 4-Axle or more Trucks	0	0	0	1	1	1	3	12	1	0	19	0	38	0	0	0	0	0	1	0	3	0	0	1	0	5
Total Existing (2016) Actual Vehicles	9	8	84	5	4	9	15	74	7	92	215	10	532	1	2	65	4	21	13	2	123	34	278	63	3	609
Passenger Car Equivalent (PCE)																										
- Passenger Vehicles	8	7	83	4	3	4	9	45	5	92	185	9	454	1	2	65	4	21	12	2	117	30	260	59	3	576
- 2-Axle Trucks (PCE Factor = 1.5)	2	2	2	0	0	3	3	5	2	0	11	2	32	0	0	0	0	0	0	0	2	0	2	5	0	9
- 3-Axle Trucks (PCE Factor = 2.0)	0	0	0	0	0	4	2	28	0	0	8	0	42	0	0	0	0	0	0	0	4	8	34	0	0	46
- 4-Axle or more (PCE Factor = 3.0)	0	0	0	3	3	3	9	36	3	0	57	0	114	0	0	0	0	0	3	0	9	0	0	3	0	15
Total Existing (2016) PCE	10	9	85	7	6	14	23	114	10	92	261	11	642	1	2	65	4	21	15	2	132	38	296	67	3	646

	South Leg			North Leg			West Leg			East Leg				South Leg			North Leg			West Leg			East Leg		
Link Volumes	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total		IN	OUT	Total	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total
Total Existing (2016) Actual Vehicles	101	103	204	18	33	51	96	233	329	317	163	480		68	333	401	38	7	45	159	77	236	344	192	536
Total Existing (2016) PCE	104	108	212	27	43	70	147	285	432	364	206	570		68	355	423	40	7	47	172	83	255	366	201	567

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ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

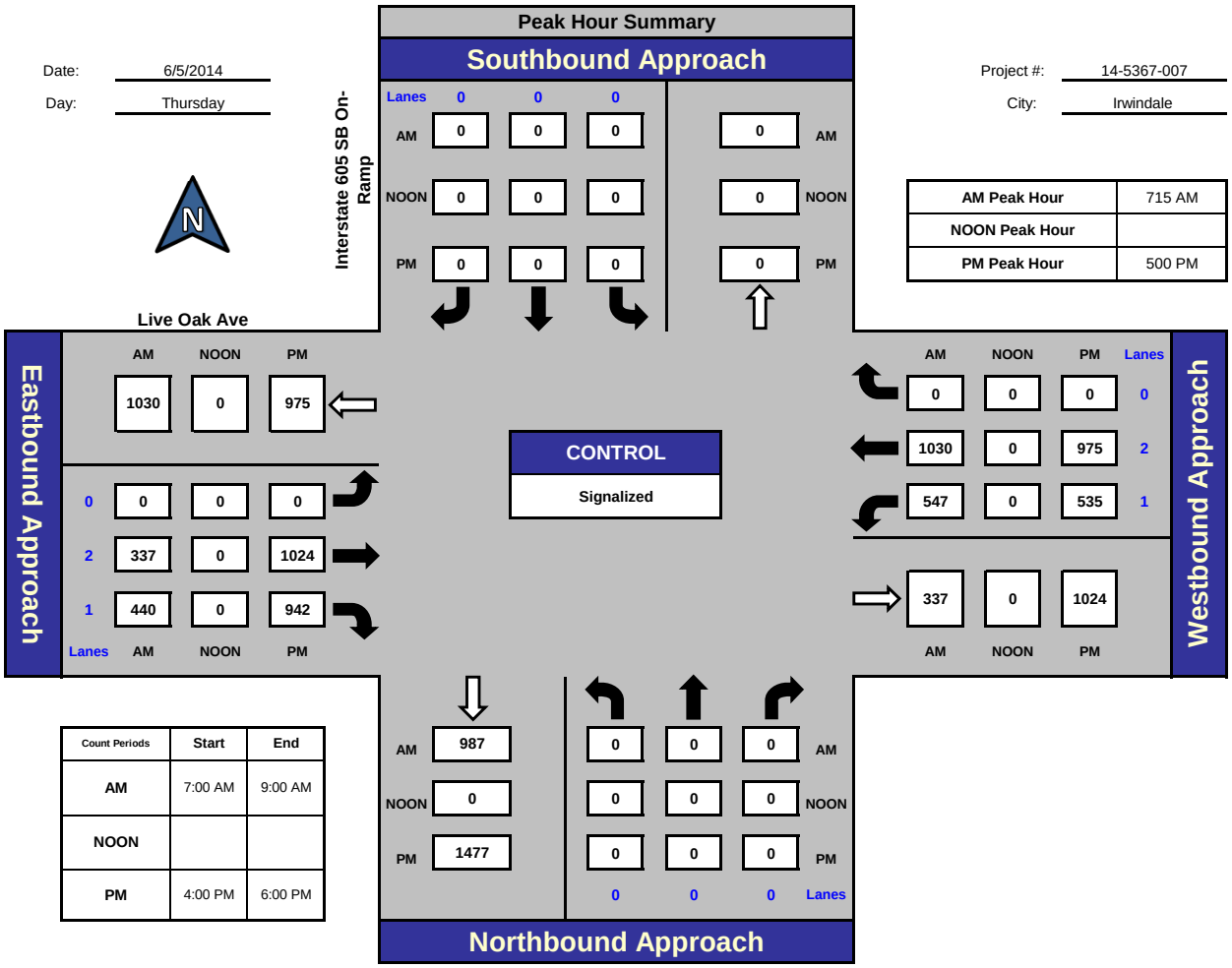
Interstate 605 SB On-Ramp and Live Oak Ave , Irwindale

Date: 6/5/2014
Day: Thursday

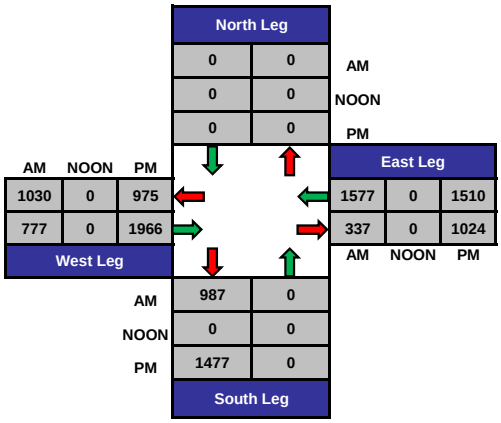
Project #: 14-5367-007
City: Irwindale

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM



Total Ins & Outs



Total Volume Per Leg

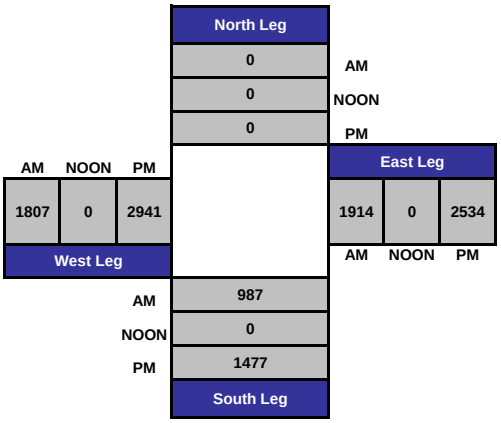


Table C-1 - Existing Peak Hour Volumes

(Intersections With Classification Counts)

	AM Peak Hour						PM Peak Hour					
	Passenger Vehicles	Trucks				Total PCE Volume	Passenger Vehicles	Trucks				Total PCE Volume
		2 Axle	3 Axle	4 Axle	PCE			2 Axle	3 Axle	4 Axle	PCE	
8 Interstate 605 Southbound On-Ramp/Live Oak Avenue												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	0	0	0	0	0	0	0	0	0	0	0	0
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	0	0	0	0	0	0	0	0	0	0	0	0
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	291	6	22	18	107	398	984	17	16	7	79	1,063
EBR	384	13	9	34	140	524	898	29	9	6	80	978
WBL	456	24	8	59	229	685	509	2	11	13	64	573
WBT	946	18	22	44	203	1,149	929	14	3	29	114	1,043
WBR	0	0	0	0	0	0	0	0	0	0	0	0
North Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
South Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	840	37	17	93	369	1,209	1,407	31	20	19	144	1,551
Total	840	37	17	93	369	1,209	1,407	31	20	19	144	1,551
East Leg												
Approach	1,402	42	30	103	432	1,834	1,438	16	14	42	178	1,616
Departure	291	6	22	18	107	398	984	17	16	7	79	1,063
Total	1,693	48	52	121	539	2,232	2,422	33	30	49	257	2,679
West Leg												
Approach	675	19	31	52	247	922	1,882	46	25	13	159	2,041
Departure	946	18	22	44	203	1,149	929	14	3	29	114	1,043
Total	1,621	37	53	96	450	2,071	2,811	60	28	42	273	3,084
Total Approaches												
Approach	2,077	61	61	155	679	2,756	3,320	62	39	55	337	3,657
Departure	2,077	61	61	155	679	2,756	3,320	62	39	55	337	3,657
Total	4,154	122	122	310	1,358	5,512	6,640	124	78	110	674	7,314

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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

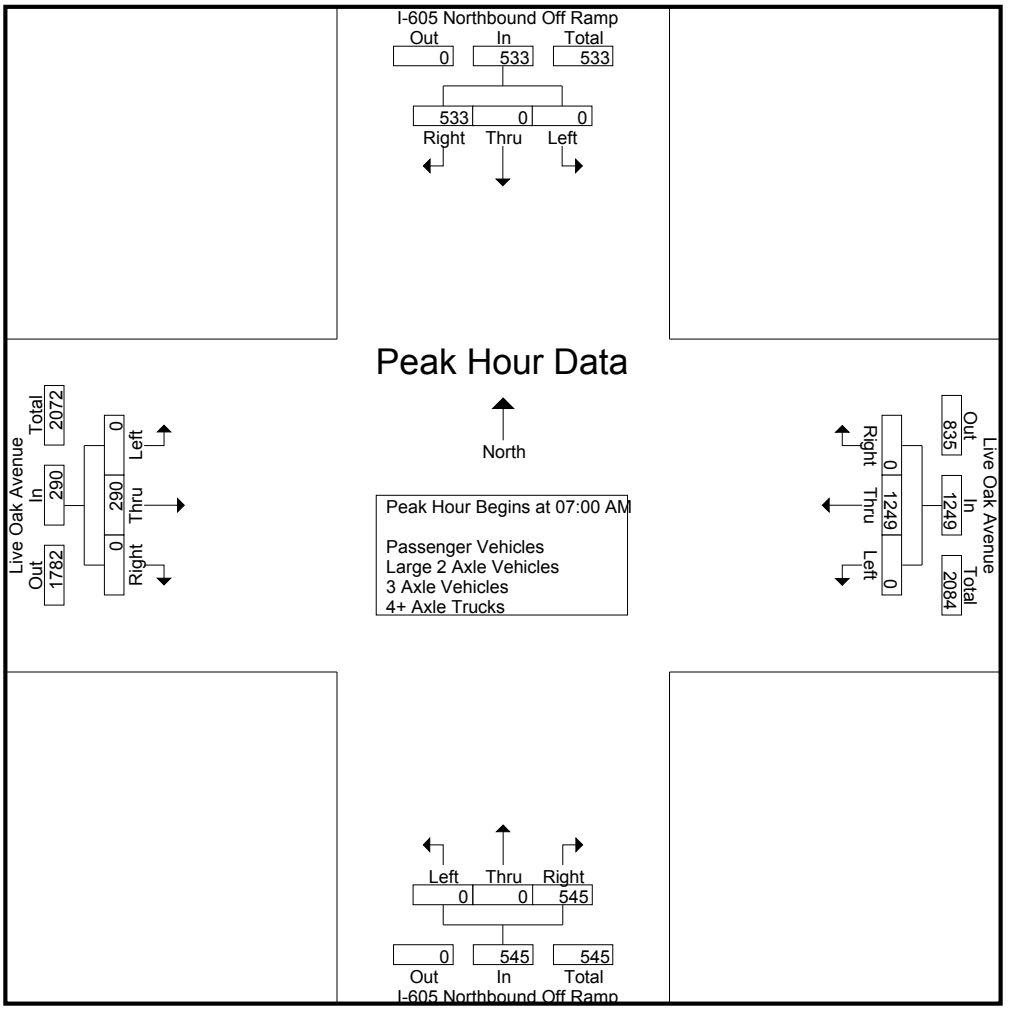
	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	108	108	0	328	0	328	0	0	121	121	0	57	0	57	614
07:15 AM	0	0	122	122	0	353	0	353	0	0	113	113	0	74	0	74	662
07:30 AM	0	0	163	163	0	293	0	293	0	0	138	138	0	69	0	69	663
07:45 AM	0	0	140	140	0	275	0	275	0	0	173	173	0	90	0	90	678
Total	0	0	533	533	0	1249	0	1249	0	0	545	545	0	290	0	290	2617
08:00 AM	0	0	127	127	0	264	0	264	0	0	91	91	0	91	0	91	573
08:15 AM	0	0	108	108	0	218	0	218	0	0	78	78	0	101	0	101	505
08:30 AM	0	0	108	108	0	241	0	241	0	0	96	96	0	97	0	97	542
08:45 AM	0	0	148	148	0	162	0	162	0	0	117	117	0	79	0	79	506
Total	0	0	491	491	0	885	0	885	0	0	382	382	0	368	0	368	2126
Grand Total	0	0	1024	1024	0	2134	0	2134	0	0	927	927	0	658	0	658	4743
Apprch %	0	0	100		0	100	0		0	0	100		0	100	0		
Total %	0	0	21.6	21.6	0	45	0	45	0	0	19.5	19.5	0	13.9	0	13.9	
Passenger Vehicles	0	0	934	934	0	1927	0	1927	0	0	761	761	0	613	0	613	4235
% Passenger Vehicles	0	0	91.2	91.2	0	90.3	0	90.3	0	0	82.1	82.1	0	93.2	0	93.2	89.3
Large 2 Axle Vehicles	0	0	19	19	0	75	0	75	0	0	26	26	0	12	0	12	132
% Large 2 Axle Vehicles	0	0	1.9	1.9	0	3.5	0	3.5	0	0	2.8	2.8	0	1.8	0	1.8	2.8
3 Axle Vehicles	0	0	27	27	0	70	0	70	0	0	35	35	0	21	0	21	153
% 3 Axle Vehicles	0	0	2.6	2.6	0	3.3	0	3.3	0	0	3.8	3.8	0	3.2	0	3.2	3.2
4+ Axle Trucks	0	0	44	44	0	62	0	62	0	0	105	105	0	12	0	12	223
% 4+ Axle Trucks	0	0	4.3	4.3	0	2.9	0	2.9	0	0	11.3	11.3	0	1.8	0	1.8	4.7

	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	108	108	0	328	0	328	0	0	121	121	0	57	0	57	614
07:15 AM	0	0	122	122	0	**353**	0	**353**	0	0	113	113	0	74	0	74	662
07:30 AM	0	0	**163**	**163**	0	293	0	293	0	0	138	138	0	69	0	69	663
07:45 AM	0	0	140	140	0	275	0	275	0	0	**173**	**173**	0	**90**	0	**90**	**678**
Total Volume	0	0	533	533	0	1249	0	1249	0	0	545	545	0	290	0	290	2617
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.817	.817	.000	.885	.000	.885	.000	.000	.788	.788	.000	.806	.000	.806	.965

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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				07:45 AM			
+0 mins.	0	0	122	122	0	328	0	328	0	0	121	121	0	90	0	90
+15 mins.	0	0	**163**	**163**	0	**353**	0	**353**	0	0	113	113	0	91	0	91
+30 mins.	0	0	140	140	0	293	0	293	0	0	138	138	0	**101**	0	**101**
+45 mins.	0	0	127	127	0	275	0	275	0	0	**173**	**173**	0	97	0	97
Total Volume	0	0	552	552	0	1249	0	1249	0	0	545	545	0	379	0	379
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.847	.847	.000	.885	.000	.885	.000	.000	.788	.788	.000	.938	.000	.938

Counts Unlimited
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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles

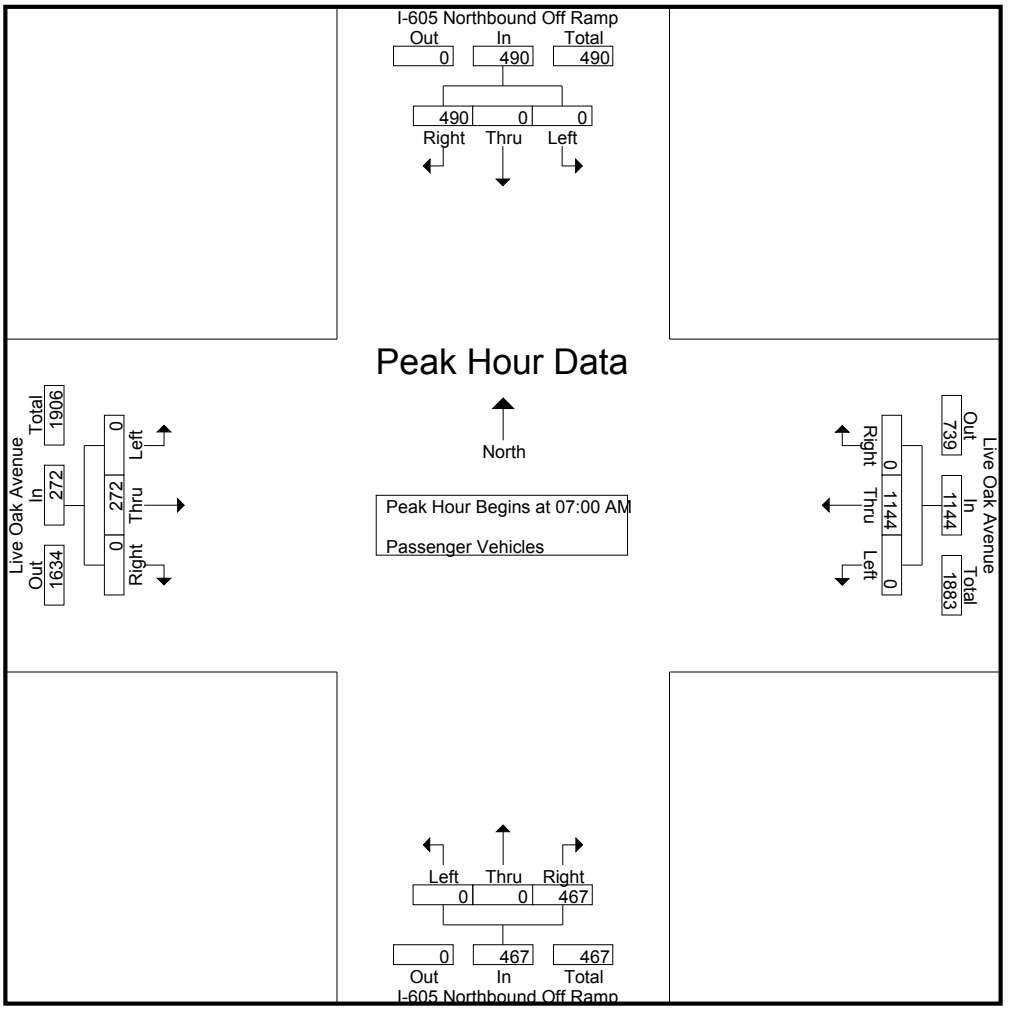
	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	93	93	0	311	0	311	0	0	97	97	0	55	0	55	556
07:15 AM	0	0	116	116	0	322	0	322	0	0	96	96	0	70	0	70	604
07:30 AM	0	0	155	155	0	271	0	271	0	0	118	118	0	63	0	63	607
07:45 AM	0	0	126	126	0	240	0	240	0	0	156	156	0	84	0	84	606
Total	0	0	490	490	0	1144	0	1144	0	0	467	467	0	272	0	272	2373
08:00 AM	0	0	119	119	0	234	0	234	0	0	70	70	0	84	0	84	507
08:15 AM	0	0	92	92	0	194	0	194	0	0	62	62	0	93	0	93	441
08:30 AM	0	0	94	94	0	221	0	221	0	0	79	79	0	91	0	91	485
08:45 AM	0	0	139	139	0	134	0	134	0	0	83	83	0	73	0	73	429
Total	0	0	444	444	0	783	0	783	0	0	294	294	0	341	0	341	1862
Grand Total	0	0	934	934	0	1927	0	1927	0	0	761	761	0	613	0	613	4235
Apprch %	0	0	100		0	100	0		0	0	100		0	100	0		
Total %	0	0	22.1	22.1	0	45.5	0	45.5	0	0	18	18	0	14.5	0	14.5	

	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	93	93	0	311	0	311	0	0	97	97	0	55	0	55	556
07:15 AM	0	0	116	116	0	**322**	0	**322**	0	0	96	96	0	70	0	70	604
07:30 AM	0	0	**155**	**155**	0	271	0	271	0	0	118	118	0	63	0	63	**607**
07:45 AM	0	0	126	126	0	240	0	240	0	0	**156**	**156**	0	**84**	0	**84**	606
Total Volume	0	0	490	490	0	1144	0	1144	0	0	467	467	0	272	0	272	2373
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.790	.790	.000	.888	.000	.888	.000	.000	.748	.748	.000	.810	.000	.810	.977

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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	93	93	0	311	0	311	0	0	97	97	0	55	0	55
+15 mins.	0	0	116	116	0	**322**	0	**322**	0	0	96	96	0	70	0	70
+30 mins.	0	0	**155**	**155**	0	271	0	271	0	0	118	118	0	63	0	63
+45 mins.	0	0	126	126	0	240	0	240	0	0	**156**	**156**	0	**84**	0	**84**
Total Volume	0	0	490	490	0	1144	0	1144	0	0	467	467	0	272	0	272
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.790	.790	.000	.888	.000	.888	.000	.000	.748	.748	.000	.810	.000	.810

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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Large 2 Axle Vehicles

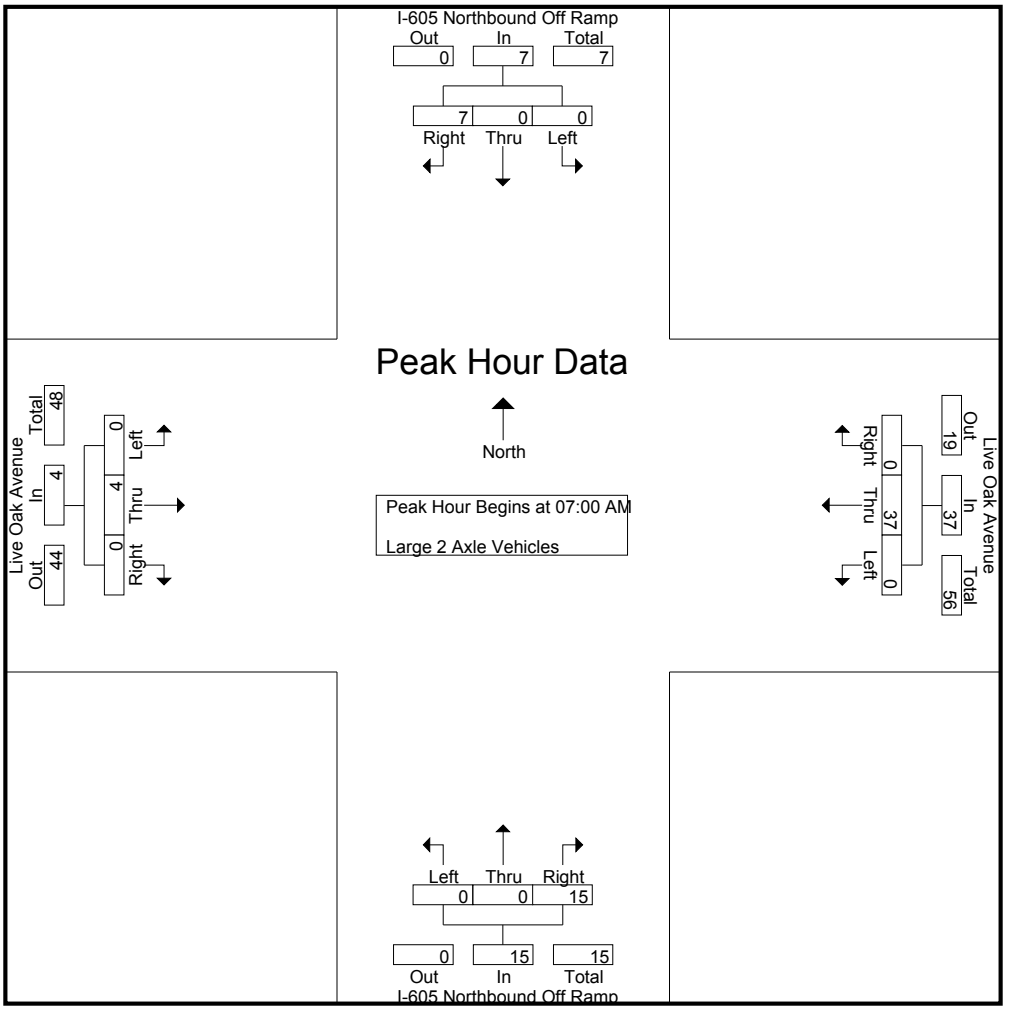
	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	2	2	0	5	0	5	0	0	9	9	0	0	0	0	16
07:15 AM	0	0	0	0	0	13	0	13	0	0	1	1	0	1	0	1	15
07:30 AM	0	0	3	3	0	6	0	6	0	0	2	2	0	1	0	1	12
07:45 AM	0	0	2	2	0	13	0	13	0	0	3	3	0	2	0	2	20
Total	0	0	7	7	0	37	0	37	0	0	15	15	0	4	0	4	63
08:00 AM	0	0	1	1	0	13	0	13	0	0	4	4	0	2	0	2	20
08:15 AM	0	0	4	4	0	7	0	7	0	0	1	1	0	4	0	4	16
08:30 AM	0	0	3	3	0	7	0	7	0	0	1	1	0	0	0	0	11
08:45 AM	0	0	4	4	0	11	0	11	0	0	5	5	0	2	0	2	22
Total	0	0	12	12	0	38	0	38	0	0	11	11	0	8	0	8	69
Grand Total	0	0	19	19	0	75	0	75	0	0	26	26	0	12	0	12	132
Apprch %	0	0	100		0	100	0		0	0	100		0	100	0		
Total %	0	0	14.4	14.4	0	56.8	0	56.8	0	0	19.7	19.7	0	9.1	0	9.1	

	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	2	2	0	5	0	5	0	0	**9**	**9**	0	0	0	0	16
07:15 AM	0	0	0	0	0	**13**	0	**13**	0	0	1	1	0	1	0	1	15
07:30 AM	0	0	**3**	**3**	0	6	0	6	0	0	2	2	0	1	0	1	12
07:45 AM	0	0	2	2	0	13	0	13	0	0	3	3	0	**2**	0	**2**	**20**
Total Volume	0	0	7	7	0	37	0	37	0	0	15	15	0	4	0	4	63
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.583	.583	.000	.712	.000	.712	.000	.000	.417	.417	.000	.500	.000	.500	.788

Counts Unlimited
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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	2	2	0	5	0	5	0	0	**9**	**9**	0	0	0	0
+15 mins.	0	0	0	0	0	**13**	0	**13**	0	0	1	1	0	1	0	1
+30 mins.	0	0	**3**	**3**	0	6	0	6	0	0	2	2	0	1	0	1
+45 mins.	0	0	2	2	0	13	0	13	0	0	3	3	0	**2**	0	**2**
Total Volume	0	0	7	7	0	37	0	37	0	0	15	15	0	4	0	4
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.583	.583	.000	.712	.000	.712	.000	.000	.417	.417	.000	.500	.000	.500

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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 3 Axle Vehicles

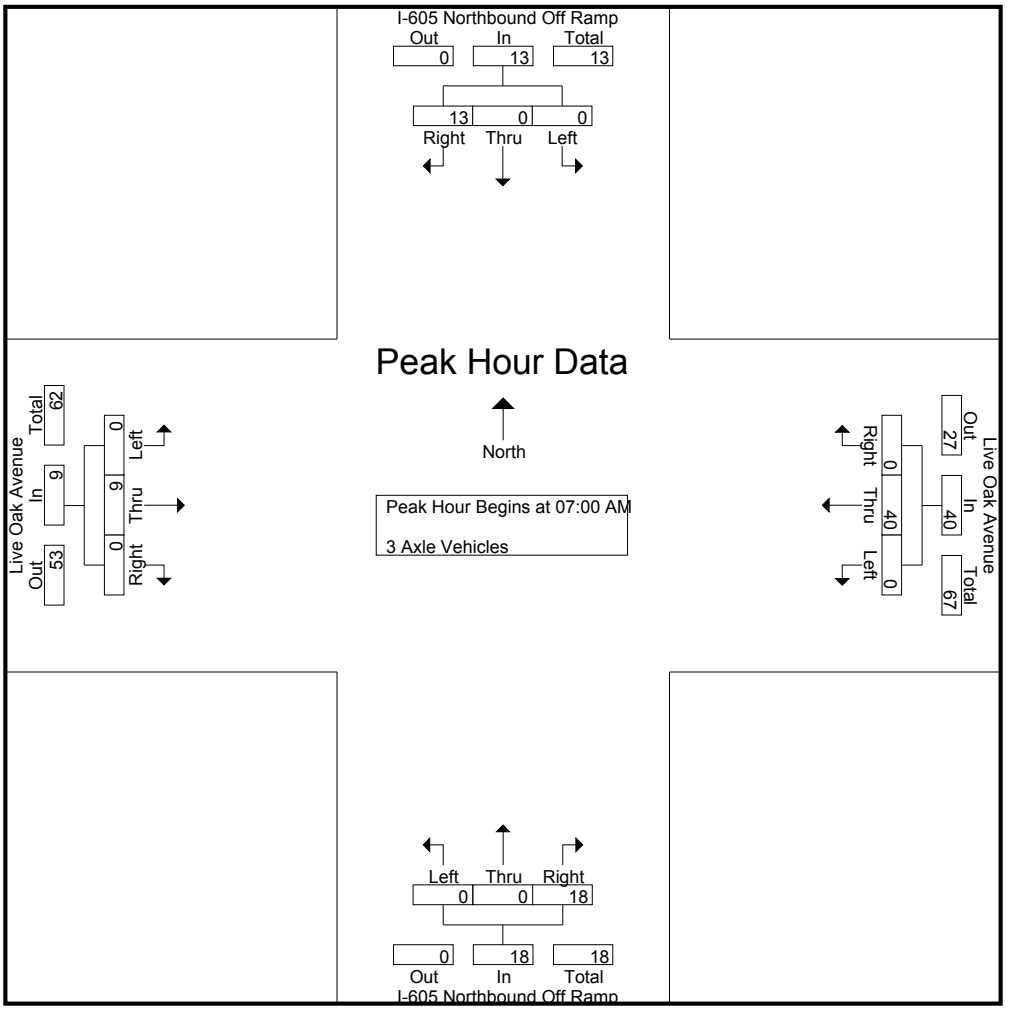
	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	7	7	0	5	0	5	0	0	5	5	0	2	0	2	19
07:15 AM	0	0	3	3	0	15	0	15	0	0	5	5	0	3	0	3	26
07:30 AM	0	0	0	0	0	11	0	11	0	0	7	7	0	3	0	3	21
07:45 AM	0	0	3	3	0	9	0	9	0	0	1	1	0	1	0	1	14
Total	0	0	13	13	0	40	0	40	0	0	18	18	0	9	0	9	80
08:00 AM	0	0	3	3	0	5	0	5	0	0	7	7	0	1	0	1	16
08:15 AM	0	0	5	5	0	12	0	12	0	0	6	6	0	2	0	2	25
08:30 AM	0	0	3	3	0	9	0	9	0	0	3	3	0	6	0	6	21
08:45 AM	0	0	3	3	0	4	0	4	0	0	1	1	0	3	0	3	11
Total	0	0	14	14	0	30	0	30	0	0	17	17	0	12	0	12	73
Grand Total	0	0	27	27	0	70	0	70	0	0	35	35	0	21	0	21	153
Apprch %	0	0	100		0	100	0		0	0	100		0	100	0		
Total %	0	0	17.6	17.6	0	45.8	0	45.8	0	0	22.9	22.9	0	13.7	0	13.7	

	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	**7**	**7**	0	5	0	5	0	0	5	5	0	2	0	2	19
07:15 AM	0	0	3	3	0	**15**	0	**15**	0	0	5	5	0	**3**	0	**3**	**26**
07:30 AM	0	0	0	0	0	11	0	11	0	0	**7**	**7**	0	3	0	3	21
07:45 AM	0	0	3	3	0	9	0	9	0	0	1	1	0	1	0	1	14
Total Volume	0	0	13	13	0	40	0	40	0	0	18	18	0	9	0	9	80
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.464	.464	.000	.667	.000	.667	.000	.000	.643	.643	.000	.750	.000	.750	.769

Counts Unlimited
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Corona, CA 92878
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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	**7**	**7**	0	5	0	5	0	0	5	5	0	2	0	2
+15 mins.	0	0	3	3	0	**15**	0	**15**	0	0	5	5	0	**3**	0	**3**
+30 mins.	0	0	0	0	0	11	0	11	0	0	**7**	**7**	0	3	0	3
+45 mins.	0	0	3	3	0	9	0	9	0	0	1	1	0	1	0	1
Total Volume	0	0	13	13	0	40	0	40	0	0	18	18	0	9	0	9
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.464	.464	.000	.667	.000	.667	.000	.000	.643	.643	.000	.750	.000	.750

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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 4+ Axle Trucks

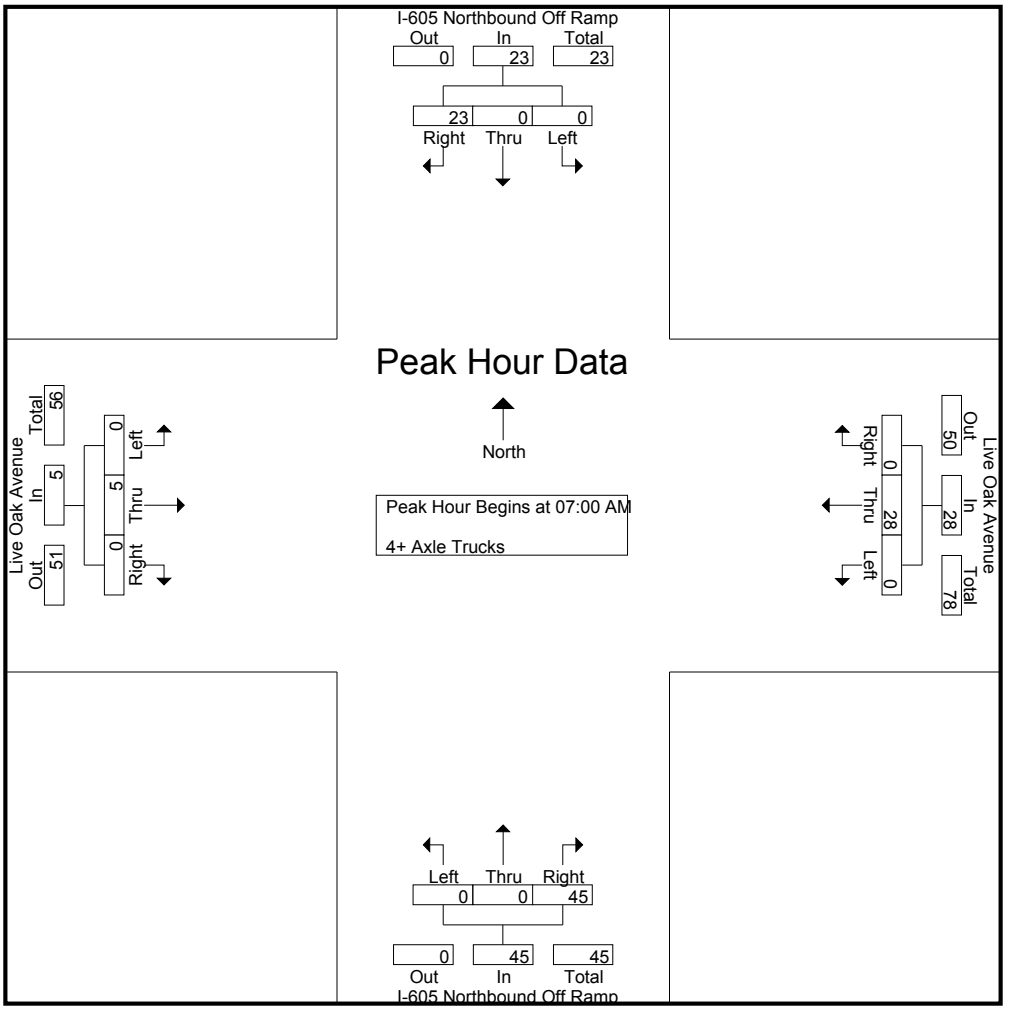
	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	6	6	0	7	0	7	0	0	10	10	0	0	0	0	23
07:15 AM	0	0	3	3	0	3	0	3	0	0	11	11	0	0	0	0	17
07:30 AM	0	0	5	5	0	5	0	5	0	0	11	11	0	2	0	2	23
07:45 AM	0	0	9	9	0	13	0	13	0	0	13	13	0	3	0	3	38
Total	0	0	23	23	0	28	0	28	0	0	45	45	0	5	0	5	101
08:00 AM	0	0	4	4	0	12	0	12	0	0	10	10	0	4	0	4	30
08:15 AM	0	0	7	7	0	5	0	5	0	0	9	9	0	2	0	2	23
08:30 AM	0	0	8	8	0	4	0	4	0	0	13	13	0	0	0	0	25
08:45 AM	0	0	2	2	0	13	0	13	0	0	28	28	0	1	0	1	44
Total	0	0	21	21	0	34	0	34	0	0	60	60	0	7	0	7	122
Grand Total	0	0	44	44	0	62	0	62	0	0	105	105	0	12	0	12	223
Apprch %	0	0	100		0	100	0		0	0	100		0	100	0		
Total %	0	0	19.7	19.7	0	27.8	0	27.8	0	0	47.1	47.1	0	5.4	0	5.4	

	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	6	6	0	7	0	7	0	0	10	10	0	0	0	0	23
07:15 AM	0	0	3	3	0	3	0	3	0	0	11	11	0	0	0	0	17
07:30 AM	0	0	5	5	0	5	0	5	0	0	11	11	0	2	0	2	23
07:45 AM	0	0	**9**	**9**	0	**13**	0	**13**	0	0	**13**	**13**	0	**3**	0	**3**	**38**
Total Volume	0	0	23	23	0	28	0	28	0	0	45	45	0	5	0	5	101
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.639	.639	.000	.538	.000	.538	.000	.000	.865	.865	.000	.417	.000	.417	.664

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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	6	6	0	7	0	7	0	0	10	10	0	0	0	0
+15 mins.	0	0	3	3	0	3	0	3	0	0	11	11	0	0	0	0
+30 mins.	0	0	5	5	0	5	0	5	0	0	11	11	0	2	0	2
+45 mins.	0	0	**9**	**9**	0	**13**	0	**13**	0	0	**13**	**13**	0	**3**	0	**3**
Total Volume	0	0	23	23	0	28	0	28	0	0	45	45	0	5	0	5
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.639	.639	.000	.538	.000	.538	.000	.000	.865	.865	.000	.417	.000	.417

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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

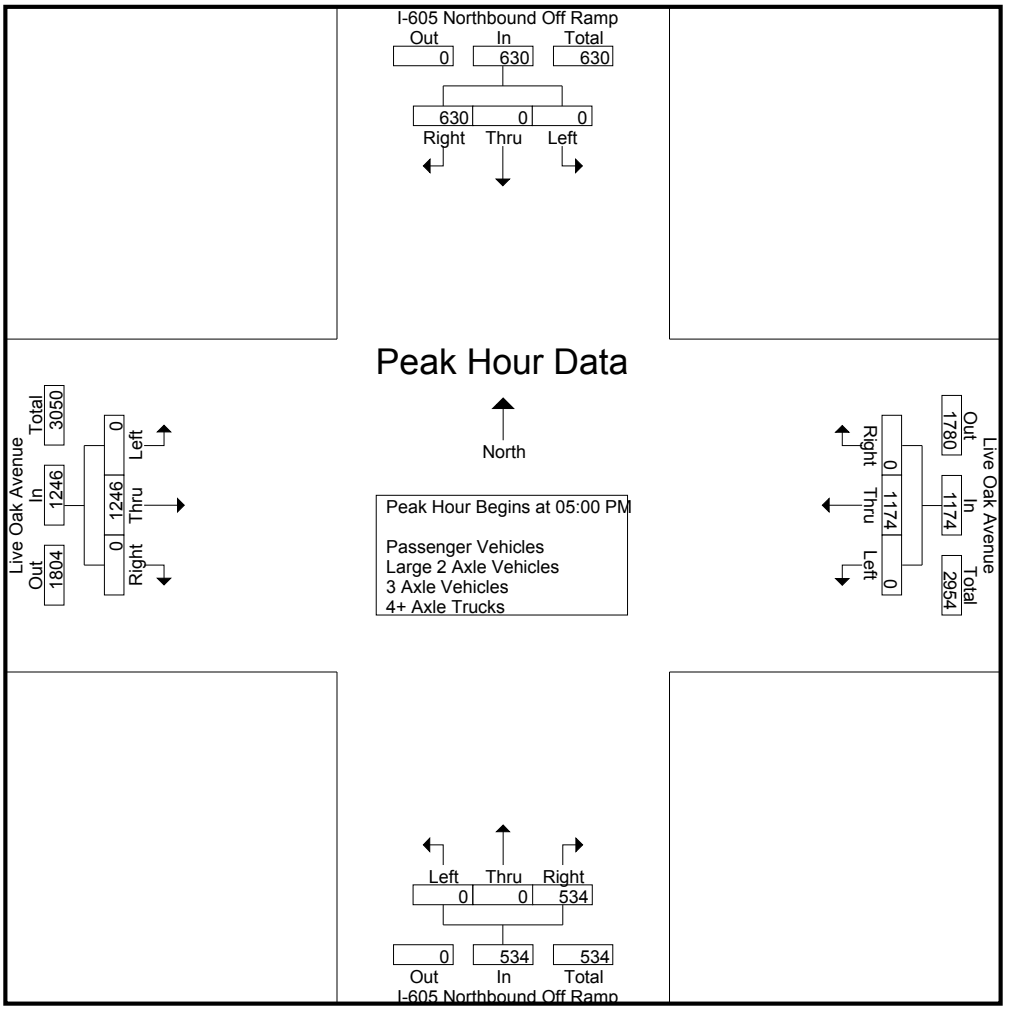
	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	114	114	0	213	0	213	0	0	152	152	0	196	0	196	675
04:15 PM	0	0	160	160	0	213	0	213	0	0	169	169	0	201	0	201	743
04:30 PM	0	0	123	123	0	207	0	207	0	0	142	142	0	261	0	261	733
04:45 PM	0	0	153	153	0	256	0	256	0	0	130	130	0	272	0	272	811
Total	0	0	550	550	0	889	0	889	0	0	593	593	0	930	0	930	2962
05:00 PM	0	0	157	157	0	278	0	278	0	0	126	126	0	335	0	335	896
05:15 PM	0	0	157	157	0	305	0	305	0	0	152	152	0	310	0	310	924
05:30 PM	0	0	158	158	0	317	0	317	0	0	132	132	0	307	0	307	914
05:45 PM	0	0	158	158	0	274	0	274	0	0	124	124	0	294	0	294	850
Total	0	0	630	630	0	1174	0	1174	0	0	534	534	0	1246	0	1246	3584
Grand Total	0	0	1180	1180	0	2063	0	2063	0	0	1127	1127	0	2176	0	2176	6546
Apprch %	0	0	100		0	100	0		0	0	100		0	100	0		
Total %	0	0	18	18	0	31.5	0	31.5	0	0	17.2	17.2	0	33.2	0	33.2	
Passenger Vehicles	0	0	1116	1116	0	1947	0	1947	0	0	1062	1062	0	2115	0	2115	6240
% Passenger Vehicles	0	0	94.6	94.6	0	94.4	0	94.4	0	0	94.2	94.2	0	97.2	0	97.2	95.3
Large 2 Axle Vehicles	0	0	7	7	0	43	0	43	0	0	23	23	0	33	0	33	106
% Large 2 Axle Vehicles	0	0	0.6	0.6	0	2.1	0	2.1	0	0	2	2	0	1.5	0	1.5	1.6
3 Axle Vehicles	0	0	8	8	0	24	0	24	0	0	12	12	0	21	0	21	65
% 3 Axle Vehicles	0	0	0.7	0.7	0	1.2	0	1.2	0	0	1.1	1.1	0	1	0	1	1
4+ Axle Trucks	0	0	49	49	0	49	0	49	0	0	30	30	0	7	0	7	135
% 4+ Axle Trucks	0	0	4.2	4.2	0	2.4	0	2.4	0	0	2.7	2.7	0	0.3	0	0.3	2.1

	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	157	157	0	278	0	278	0	0	126	126	0	**335**	0	**335**	896
05:15 PM	0	0	157	157	0	305	0	305	0	0	**152**	**152**	0	310	0	310	**924**
05:30 PM	0	0	**158**	**158**	0	**317**	0	**317**	0	0	132	132	0	307	0	307	914
05:45 PM	0	0	158	158	0	274	0	274	0	0	124	124	0	294	0	294	850
Total Volume	0	0	630	630	0	1174	0	1174	0	0	534	534	0	1246	0	1246	3584
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.997	.997	.000	.926	.000	.926	.000	.000	.878	.878	.000	.930	.000	.930	.970

Counts Unlimited
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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:00 PM				05:00 PM			
+0 mins.	0	0	157	157	0	278	0	278	0	0	152	152	0	**335**	0	**335**
+15 mins.	0	0	157	157	0	305	0	305	0	0	**169**	**169**	0	310	0	310
+30 mins.	0	0	**158**	**158**	0	**317**	0	**317**	0	0	142	142	0	307	0	307
+45 mins.	0	0	158	158	0	274	0	274	0	0	130	130	0	294	0	294
Total Volume	0	0	630	630	0	1174	0	1174	0	0	593	593	0	1246	0	1246
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.997	.997	.000	.926	.000	.926	.000	.000	.877	.877	.000	.930	.000	.930

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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles

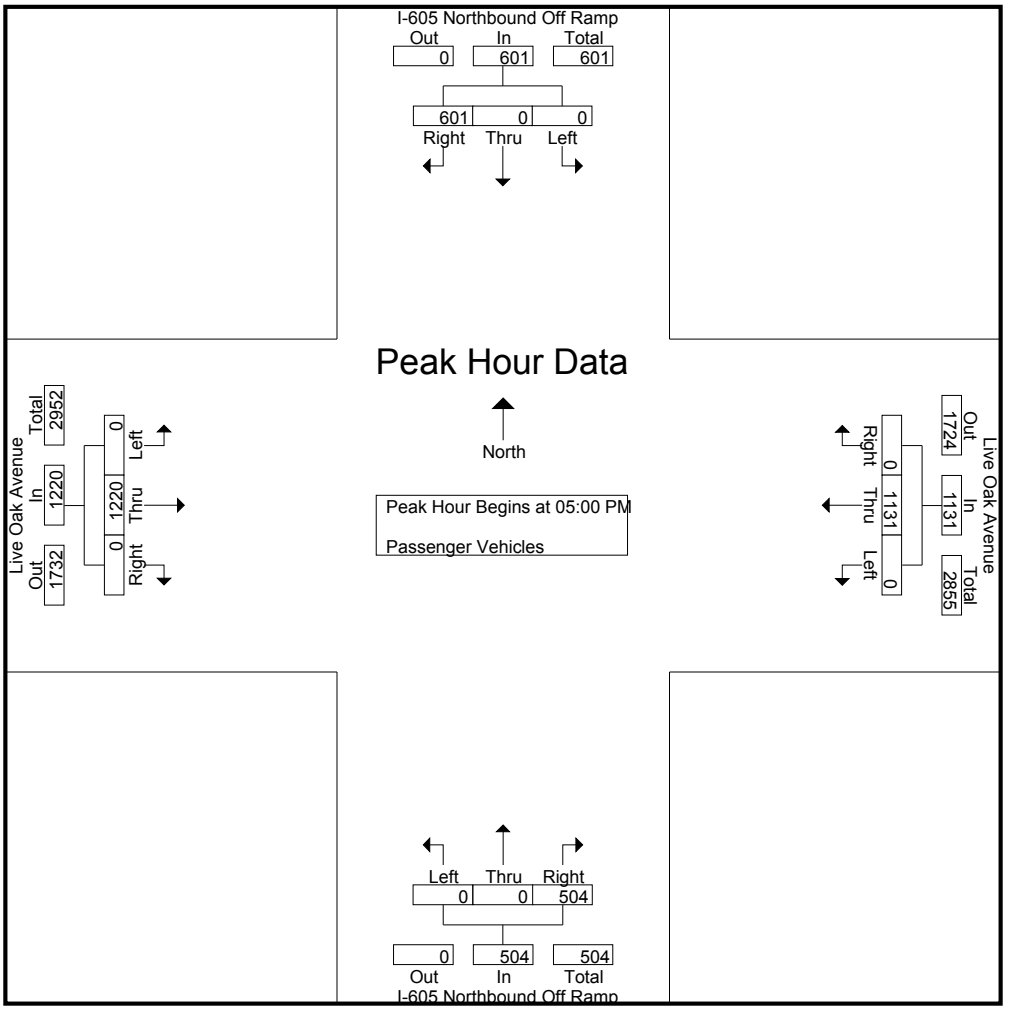
	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	106	106	0	189	0	189	0	0	140	140	0	187	0	187	622
04:15 PM	0	0	153	153	0	196	0	196	0	0	157	157	0	194	0	194	700
04:30 PM	0	0	114	114	0	195	0	195	0	0	138	138	0	249	0	249	696
04:45 PM	0	0	142	142	0	236	0	236	0	0	123	123	0	265	0	265	766
Total	0	0	515	515	0	816	0	816	0	0	558	558	0	895	0	895	2784
05:00 PM	0	0	144	144	0	267	0	267	0	0	119	119	0	322	0	322	852
05:15 PM	0	0	147	147	0	294	0	294	0	0	143	143	0	309	0	309	893
05:30 PM	0	0	152	152	0	307	0	307	0	0	128	128	0	300	0	300	887
05:45 PM	0	0	158	158	0	263	0	263	0	0	114	114	0	289	0	289	824
Total	0	0	601	601	0	1131	0	1131	0	0	504	504	0	1220	0	1220	3456
Grand Total	0	0	1116	1116	0	1947	0	1947	0	0	1062	1062	0	2115	0	2115	6240
Apprch %	0	0	100		0	100	0		0	0	100		0	100	0		
Total %	0	0	17.9	17.9	0	31.2	0	31.2	0	0	17	17	0	33.9	0	33.9	

	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	144	144	0	267	0	267	0	0	119	119	0	**322**	0	**322**	852
05:15 PM	0	0	147	147	0	294	0	294	0	0	**143**	**143**	0	309	0	309	**893**
05:30 PM	0	0	152	152	0	**307**	0	**307**	0	0	128	128	0	300	0	300	887
05:45 PM	0	0	**158**	**158**	0	263	0	263	0	0	114	114	0	289	0	289	824
Total Volume	0	0	601	601	0	1131	0	1131	0	0	504	504	0	1220	0	1220	3456
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.951	.951	.000	.921	.000	.921	.000	.000	.881	.881	.000	.947	.000	.947	.968

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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Large 2 Axle Vehicles

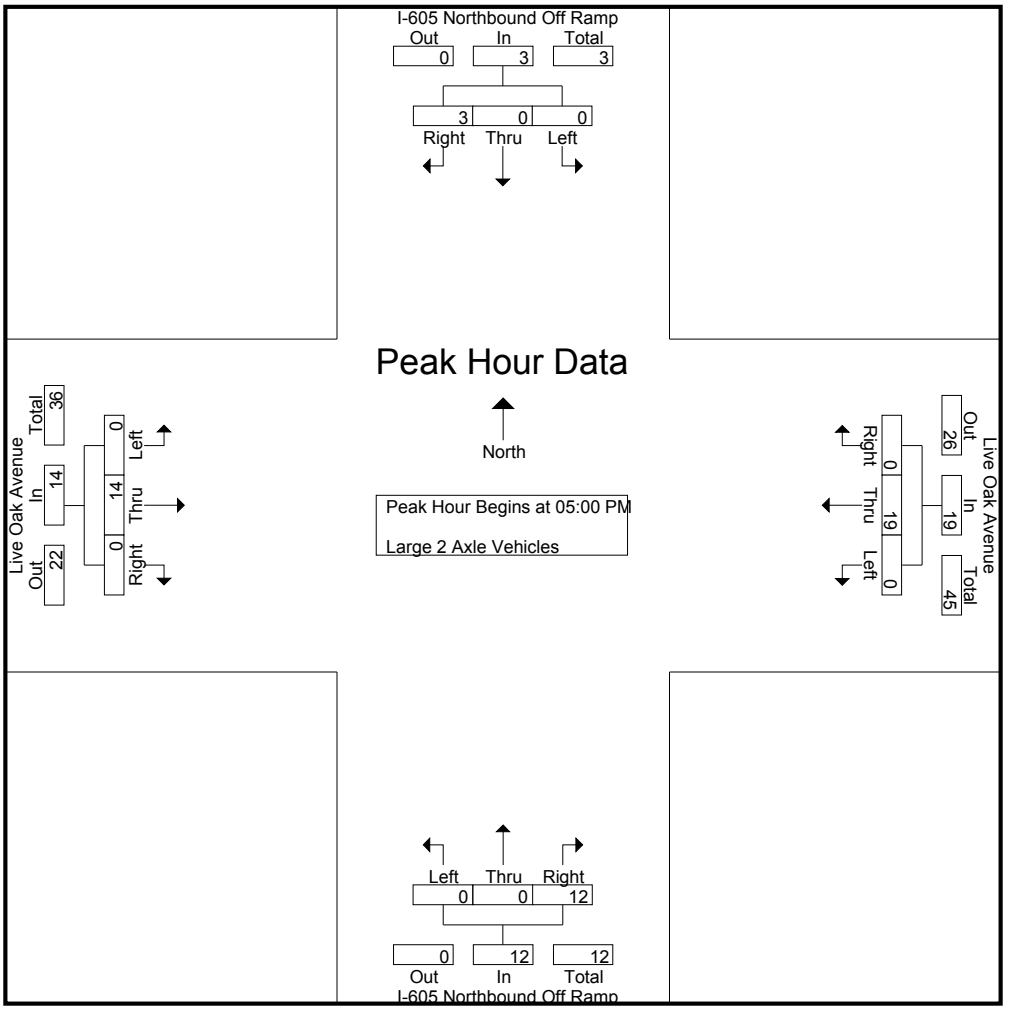
	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	6	0	6	0	0	2	2	0	3	0	3	11
04:15 PM	0	0	1	1	0	7	0	7	0	0	6	6	0	4	0	4	18
04:30 PM	0	0	1	1	0	4	0	4	0	0	2	2	0	7	0	7	14
04:45 PM	0	0	2	2	0	7	0	7	0	0	1	1	0	5	0	5	15
Total	0	0	4	4	0	24	0	24	0	0	11	11	0	19	0	19	58
05:00 PM	0	0	2	2	0	4	0	4	0	0	3	3	0	6	0	6	15
05:15 PM	0	0	1	1	0	7	0	7	0	0	4	4	0	1	0	1	13
05:30 PM	0	0	0	0	0	5	0	5	0	0	0	0	0	4	0	4	9
05:45 PM	0	0	0	0	0	3	0	3	0	0	5	5	0	3	0	3	11
Total	0	0	3	3	0	19	0	19	0	0	12	12	0	14	0	14	48
Grand Total	0	0	7	7	0	43	0	43	0	0	23	23	0	33	0	33	106
Apprch %	0	0	100		0	100	0		0	0	100		0	100	0		
Total %	0	0	6.6	6.6	0	40.6	0	40.6	0	0	21.7	21.7	0	31.1	0	31.1	

	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	**2**	**2**	0	4	0	4	0	0	3	3	0	**6**	0	**6**	**15**
05:15 PM	0	0	1	1	0	**7**	0	**7**	0	0	4	4	0	1	0	1	13
05:30 PM	0	0	0	0	0	5	0	5	0	0	0	0	0	4	0	4	9
05:45 PM	0	0	0	0	0	3	0	3	0	0	**5**	**5**	0	3	0	3	11
Total Volume	0	0	3	3	0	19	0	19	0	0	12	12	0	14	0	14	48
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.375	.375	.000	.679	.000	.679	.000	.000	.600	.600	.000	.583	.000	.583	.800

Counts Unlimited
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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	**2**	**2**	0	4	0	4	0	0	3	3	0	**6**	0	**6**
+15 mins.	0	0	1	1	0	**7**	0	**7**	0	0	4	4	0	1	0	1
+30 mins.	0	0	0	0	0	5	0	5	0	0	0	0	0	4	0	4
+45 mins.	0	0	0	0	0	3	0	3	0	0	**5**	**5**	0	3	0	3
Total Volume	0	0	3	3	0	19	0	19	0	0	12	12	0	14	0	14
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.375	.375	.000	.679	.000	.679	.000	.000	.600	.600	.000	.583	.000	.583

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City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 3 Axle Vehicles

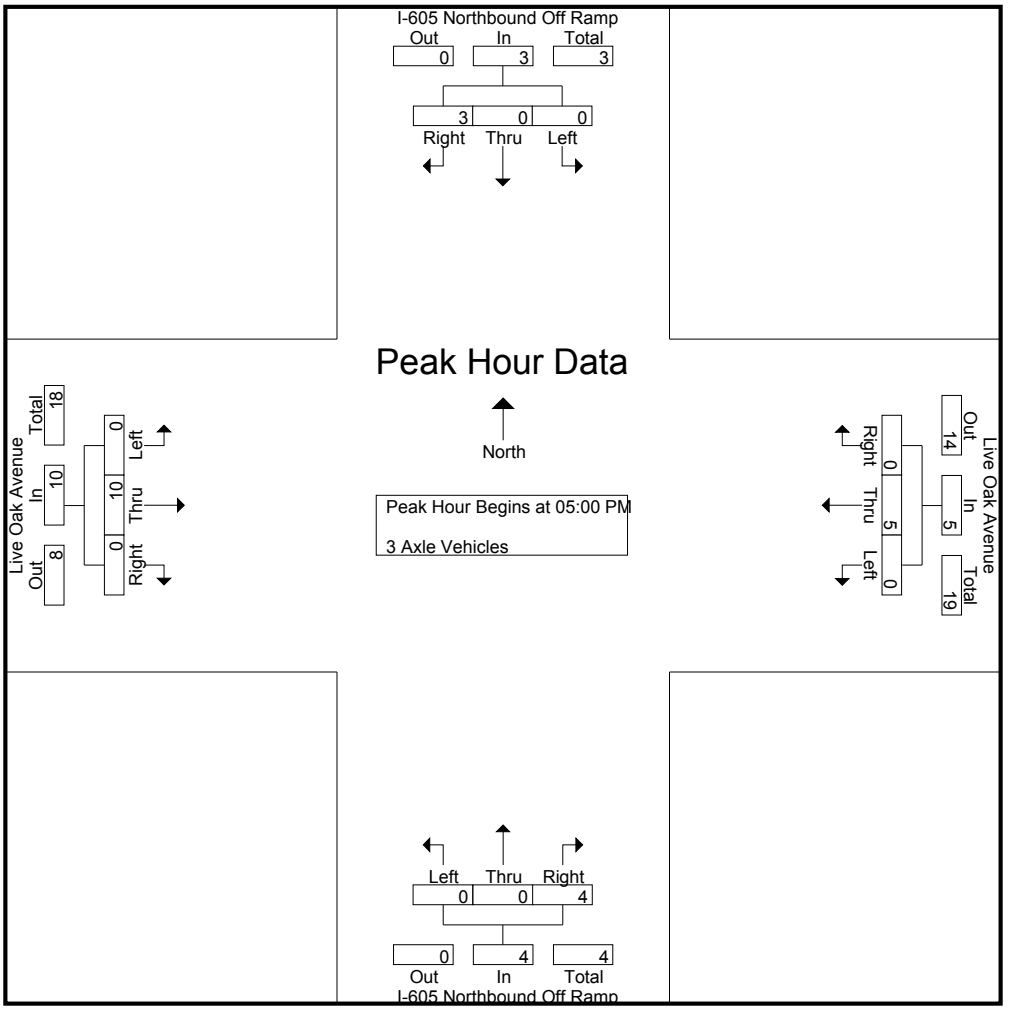
	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	2	2	0	11	0	11	0	0	3	3	0	4	0	4	20
04:15 PM	0	0	0	0	0	3	0	3	0	0	3	3	0	2	0	2	8
04:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	4	0	4	6
04:45 PM	0	0	3	3	0	3	0	3	0	0	2	2	0	1	0	1	9
Total	0	0	5	5	0	19	0	19	0	0	8	8	0	11	0	11	43
05:00 PM	0	0	1	1	0	2	0	2	0	0	1	1	0	7	0	7	11
05:15 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	1	1	0	1	0	1	0	0	1	1	0	1	0	1	4
05:45 PM	0	0	0	0	0	1	0	1	0	0	2	2	0	2	0	2	5
Total	0	0	3	3	0	5	0	5	0	0	4	4	0	10	0	10	22
Grand Total	0	0	8	8	0	24	0	24	0	0	12	12	0	21	0	21	65
Apprch %	0	0	100		0	100	0		0	0	100		0	100	0		
Total %	0	0	12.3	12.3	0	36.9	0	36.9	0	0	18.5	18.5	0	32.3	0	32.3	

	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	**1**	**1**	0	**2**	0	**2**	0	0	1	1	0	**7**	0	**7**	**11**
05:15 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	1	1	0	1	0	1	0	0	1	1	0	1	0	1	4
05:45 PM	0	0	0	0	0	1	0	1	0	0	**2**	**2**	0	2	0	2	5
Total Volume	0	0	3	3	0	5	0	5	0	0	4	4	0	10	0	10	22
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.750	.750	.000	.625	.000	.625	.000	.000	.500	.500	.000	.357	.000	.357	.500

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	**1**	**1**	0	**2**	0	**2**	0	0	1	1	0	**7**	0	**7**
+15 mins.	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0
+30 mins.	0	0	1	1	0	1	0	1	0	0	1	1	0	1	0	1
+45 mins.	0	0	0	0	0	1	0	1	0	0	**2**	**2**	0	2	0	2
Total Volume	0	0	3	3	0	5	0	5	0	0	4	4	0	10	0	10
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.750	.750	.000	.625	.000	.625	.000	.000	.500	.500	.000	.357	.000	.357

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIPM
Site Code : 05116051
Start Date : 1/27/2016

Groups Printed- 4+ Axle Trucks

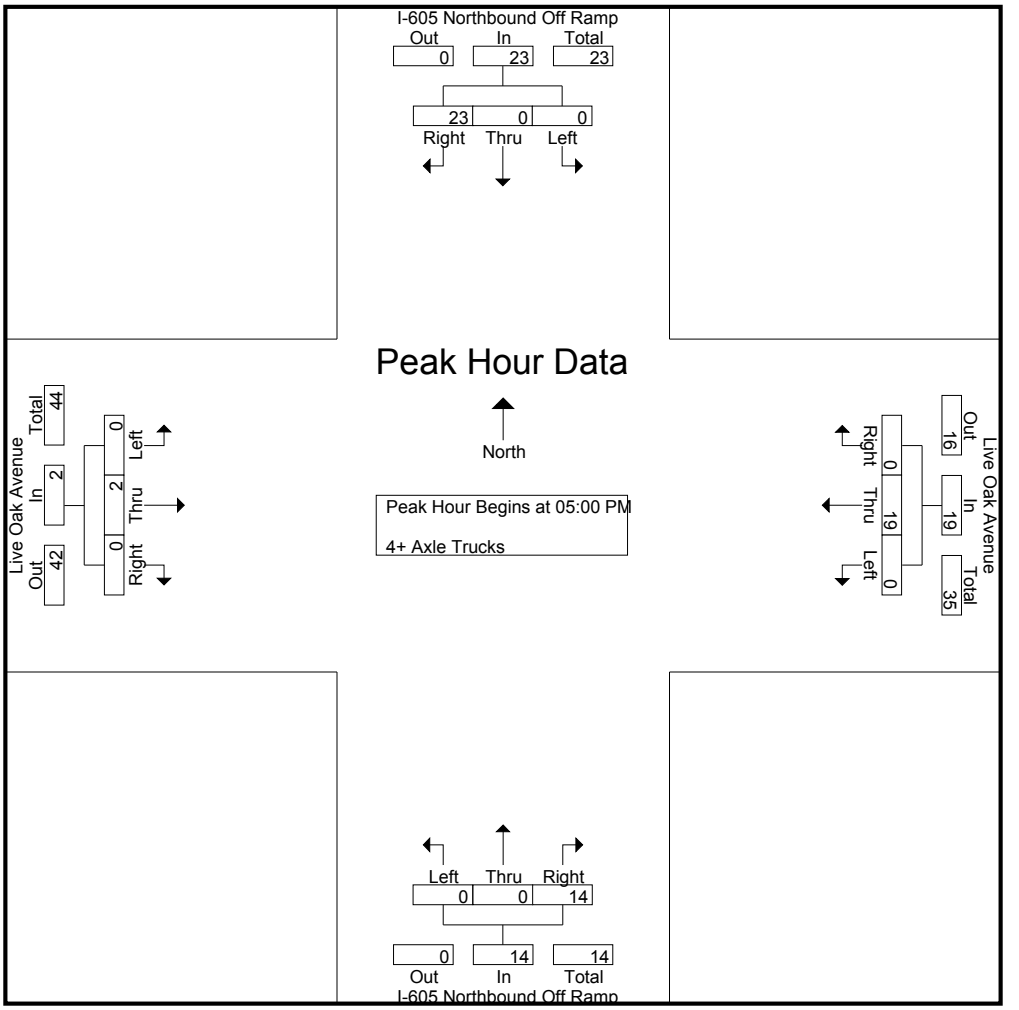
	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	6	6	0	7	0	7	0	0	7	7	0	2	0	2	22
04:15 PM	0	0	6	6	0	7	0	7	0	0	3	3	0	1	0	1	17
04:30 PM	0	0	8	8	0	6	0	6	0	0	2	2	0	1	0	1	17
04:45 PM	0	0	6	6	0	10	0	10	0	0	4	4	0	1	0	1	21
Total	0	0	26	26	0	30	0	30	0	0	16	16	0	5	0	5	77
05:00 PM	0	0	10	10	0	5	0	5	0	0	3	3	0	0	0	0	18
05:15 PM	0	0	8	8	0	3	0	3	0	0	5	5	0	0	0	0	16
05:30 PM	0	0	5	5	0	4	0	4	0	0	3	3	0	2	0	2	14
05:45 PM	0	0	0	0	0	7	0	7	0	0	3	3	0	0	0	0	10
Total	0	0	23	23	0	19	0	19	0	0	14	14	0	2	0	2	58
Grand Total	0	0	49	49	0	49	0	49	0	0	30	30	0	7	0	7	135
Apprch %	0	0	100		0	100	0		0	0	100		0	100	0		
Total %	0	0	36.3	36.3	0	36.3	0	36.3	0	0	22.2	22.2	0	5.2	0	5.2	

	I-605 Northbound Off Ramp Southbound				Live Oak Avenue Westbound				I-605 Northbound Off Ramp Northbound				Live Oak Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	**10**	**10**	0	5	0	5	0	0	3	3	0	0	0	0	**18**
05:15 PM	0	0	8	8	0	3	0	3	0	0	**5**	**5**	0	0	0	0	16
05:30 PM	0	0	5	5	0	4	0	4	0	0	3	3	0	**2**	0	**2**	14
05:45 PM	0	0	0	0	0	**7**	0	**7**	0	0	3	3	0	0	0	0	10
Total Volume	0	0	23	23	0	19	0	19	0	0	14	14	0	2	0	2	58
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.575	.575	.000	.679	.000	.679	.000	.000	.700	.700	.000	.250	.000	.250	.806

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Irwindale
N/S: I-605 Northbound Off Ramps
E/W: Live Oak Avenue
Weather: Clear

File Name : IRW605NLIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	**10**	**10**	0	5	0	5	0	0	3	3	0	0	0	0
+15 mins.	0	0	8	8	0	3	0	3	0	0	**5**	**5**	0	0	0	0
+30 mins.	0	0	5	5	0	4	0	4	0	0	3	3	0	**2**	0	**2**
+45 mins.	0	0	0	0	0	**7**	0	**7**	0	0	3	3	0	0	0	0
Total Volume	0	0	23	23	0	19	0	19	0	0	14	14	0	2	0	2
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.575	.575	.000	.679	.000	.679	.000	.000	.700	.700	.000	.250	.000	.250

Existing (2016) PCE Conversion

8. I-605 NB Off-Ramp / Live Oak Av.

	AM PEAK HOUR												AM TOTAL	PM PEAK HOUR											PM TOTAL
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
Existing (2016)																										
- Passenger Vehicles	0	0	467	0	0	490	0	272	0	0	1,144	0	2,373	0	0	504	0	0	601	0	1,220	0	0	1,131	0	3,456
- 2-Axle Trucks	0	0	15	0	0	7	0	4	0	0	37	0	63	0	0	12	0	0	3	0	14	0	0	19	0	48
- 3-Axle Trucks	0	0	18	0	0	13	0	9	0	0	40	0	80	0	0	4	0	0	3	0	10	0	0	5	0	22
- 4-Axle or more Trucks	0	0	45	0	0	23	0	5	0	0	28	0	101	0	0	14	0	0	23	0	2	0	0	19	0	58
Total Existing (2016) Actual Vehicles	0	0	545	0	0	533	0	290	0	0	1,249	0	2,617	0	0	534	0	0	630	0	1,246	0	0	1,174	0	3,584
Passenger Car Equivalent (PCE)																										
- Passenger Vehicles	0	0	467	0	0	490	0	272	0	0	1,144	0	2,373	0	0	504	0	0	601	0	1,220	0	0	1,131	0	3,456
- 2-Axle Trucks (PCE Factor = 1.5)	0	0	23	0	0	11	0	6	0	0	56	0	96	0	0	18	0	0	5	0	21	0	0	29	0	73
- 3-Axle Trucks (PCE Factor = 2.0)	0	0	36	0	0	26	0	18	0	0	80	0	160	0	0	8	0	0	6	0	20	0	0	10	0	44
- 4-Axle or more (PCE Factor = 3.0)	0	0	135	0	0	69	0	15	0	0	84	0	303	0	0	42	0	0	69	0	6	0	0	57	0	174
Total Existing (2016) PCE	0	0	661	0	0	596	0	311	0	0	1,364	0	2,932	0	0	572	0	0	681	0	1,267	0	0	1,227	0	3,747

	South Leg			North Leg			West Leg			East Leg				South Leg			North Leg			West Leg			East Leg			
Link Volumes	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total		IN	OUT	Total	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total	
Total Existing (2016) Actual Vehicles	545	0	545	533	0	533	290	1,782	2,072	1,249	835	2,084		534	0	534	630	0	630	1,246	1,804	3,050	1,174	1,780	2,954	
Total Existing (2016) PCE	661	0	661	596	0	596	311	1,960	2,271	1,364	972	2,336		572	0	572	681	0	681	1,267	1,908	3,175	1,227	1,839	3,066	

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ITM Peak Hour Summary

Prepared by:

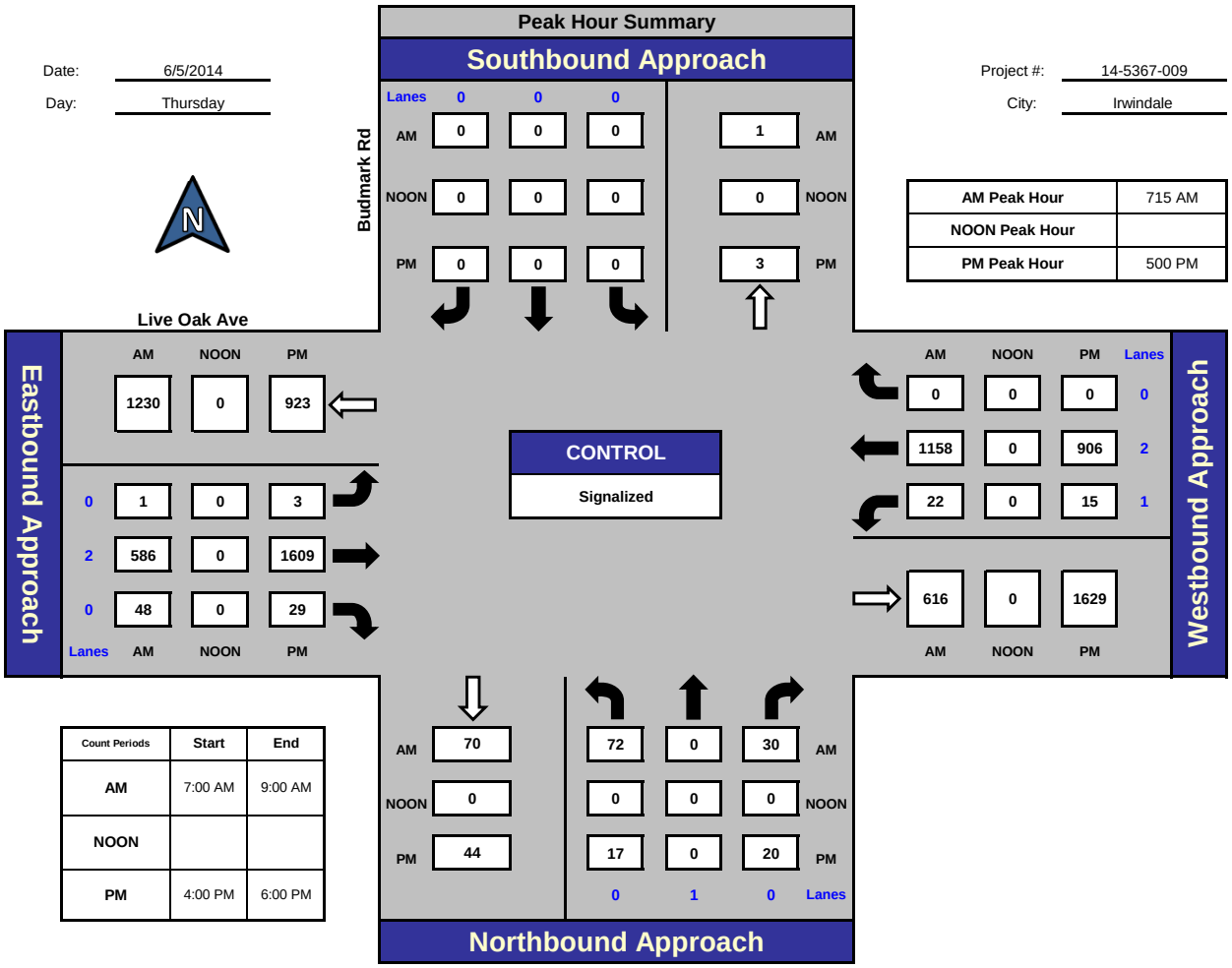
National Data & Surveying Services

Budmark Rd and Live Oak Ave , Irwindale

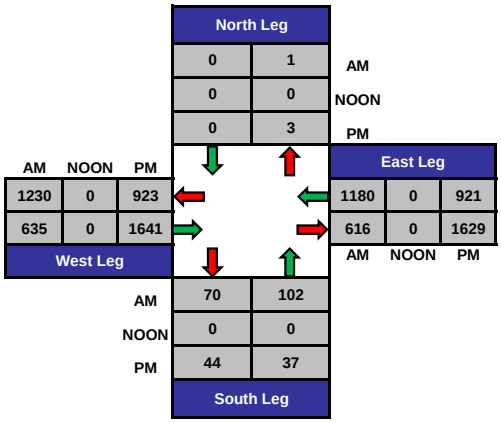
Date: 6/5/2014
Day: Thursday

Project #: 14-5367-009
City: Irwindale

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	500 PM



Total Ins & Outs



Total Volume Per Leg

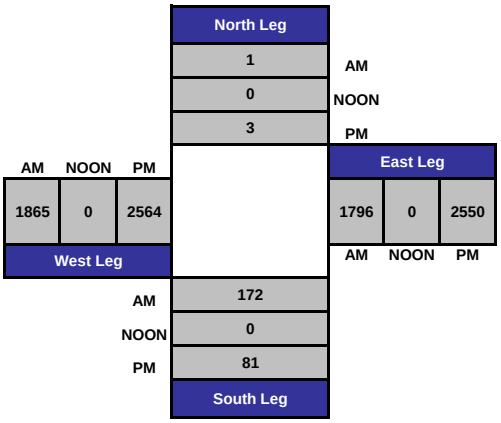


Table C-1 - Existing Peak Hour Volumes

(Intersections With Classification Counts)

	AM Peak Hour						PM Peak Hour					
	Passenger Vehicles	Trucks				Total PCE Volume	Passenger Vehicles	Trucks				Total PCE Volume
		2 Axle	3 Axle	4 Axle	PCE			2 Axle	3 Axle	4 Axle	PCE	
10 Graham Road/Live Oak Avenue												
NBL	23	14	1	34	125	148	17	0	0	0	0	17
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	13	2	5	10	43	56	19	1	0	0	2	21
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	0	0	0	0	0	0	0	0	0	0	0	0
EBL	2	0	0	0	0	2	6	0	0	0	0	6
EBT	522	9	29	26	150	672	1,548	24	22	15	125	1,673
EBR	14	3	9	22	89	103	9	13	6	1	35	44
WBL	15	0	2	9	31	46	20	1	1	3	13	33
WBT	1,060	27	20	51	234	1,294	872	9	2	23	87	959
WBR	0	0	0	0	0	0	0	0	0	0	0	0
North Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	2	0	0	0	0	2	6	0	0	0	0	6
Total	2	0	0	0	0	2	6	0	0	0	0	6
South Leg												
Approach	36	16	6	44	168	204	36	1	0	0	2	38
Departure	29	3	11	31	120	149	29	14	7	4	48	77
Total	65	19	17	75	288	353	65	15	7	4	50	115
East Leg												
Approach	1,075	27	22	60	265	1,340	892	10	3	26	100	992
Departure	535	11	34	36	193	728	1,567	25	22	15	127	1,694
Total	1,610	38	56	96	458	2,068	2,459	35	25	41	227	2,686
West Leg												
Approach	538	12	38	48	239	777	1,563	37	28	16	160	1,723
Departure	1,083	41	21	85	359	1,442	889	9	2	23	87	976
Total	1,621	53	59	133	598	2,219	2,452	46	30	39	247	2,699
Total Approaches												
Approach	1,649	55	66	152	672	2,321	2,491	48	31	42	262	2,753
Departure	1,649	55	66	152	672	2,321	2,491	48	31	42	262	2,753
Total	3,298	110	132	304	1,344	4,642	4,982	96	62	84	524	5,506

ITM Peak Hour Summary

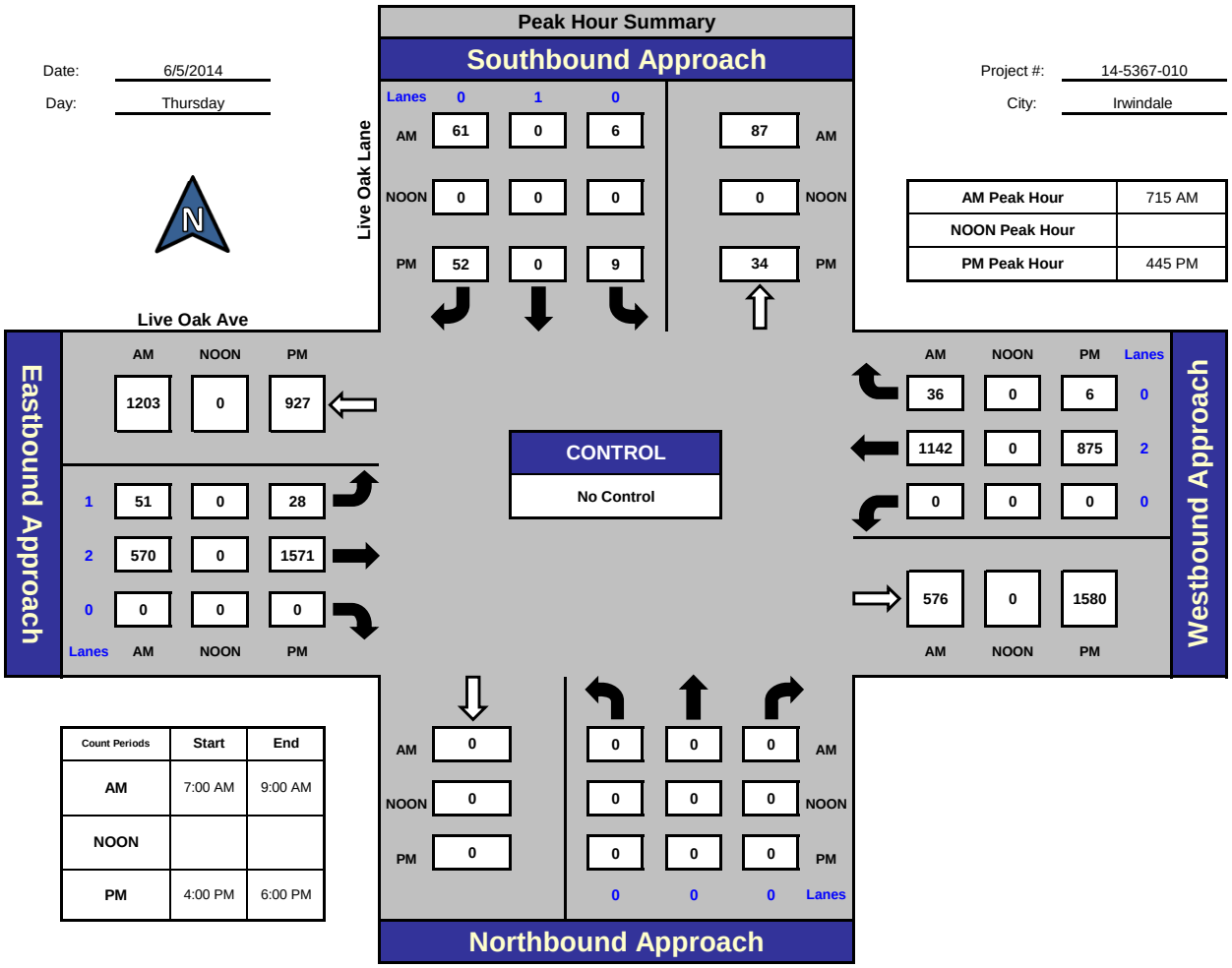
Prepared by:

National Data & Surveying Services

Live Oak Lane and Live Oak Ave , Irwindale

Date: 6/5/2014
Day: Thursday

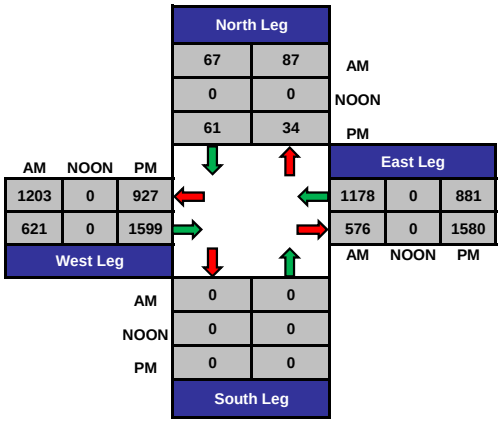
Project #: 14-5367-010
City: Irwindale



AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg

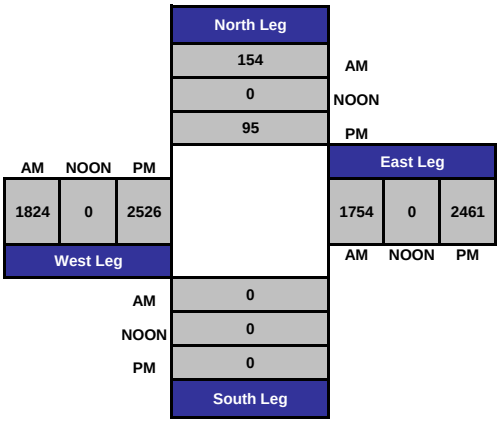


Table C-1 - Existing Peak Hour Volumes

(Intersections With Classification Counts)

	AM Peak Hour						PM Peak Hour					
	Passenger Vehicles	Trucks				Total PCE Volume	Passenger Vehicles	Trucks				Total PCE Volume
		2 Axle	3 Axle	4 Axle	PCE			2 Axle	3 Axle	4 Axle	PCE	
11 Live Oak Lane/Live Oak Avenue												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	0	0	0	0	0	0	0	0	0	0	0	0
SBL	0	1	4	1	13	13	8	0	0	1	3	11
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	19	6	8	28	109	128	42	2	0	8	27	69
EBL	27	1	18	6	56	83	21	3	2	5	24	45
EBT	519	9	10	32	130	649	1,516	22	18	15	114	1,630
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	0	0	0	0	0	0	0	0	0	0	0	0
WBT	1,077	19	14	32	153	1,230	850	6	4	15	62	912
WBR	25	2	2	7	28	53	6	0	0	0	0	6
North Leg												
Approach	19	7	12	29	122	141	50	2	0	9	30	80
Departure	52	3	20	13	84	136	27	3	2	5	24	51
Total	71	10	32	42	206	277	77	5	2	14	54	131
South Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
East Leg												
Approach	1,102	21	16	39	181	1,283	856	6	4	15	62	918
Departure	519	10	14	33	143	662	1,524	22	18	16	117	1,641
Total	1,621	31	30	72	324	1,945	2,380	28	22	31	179	2,559
West Leg												
Approach	546	10	28	38	186	732	1,537	25	20	20	138	1,675
Departure	1,096	25	22	60	262	1,358	892	8	4	23	89	981
Total	1,642	35	50	98	448	2,090	2,429	33	24	43	227	2,656
Total Approaches												
Approach	1,667	38	56	106	489	2,156	2,443	33	24	44	230	2,673
Departure	1,667	38	56	106	489	2,156	2,443	33	24	44	230	2,673
Total	3,334	76	112	212	978	4,312	4,886	66	48	88	460	5,346

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

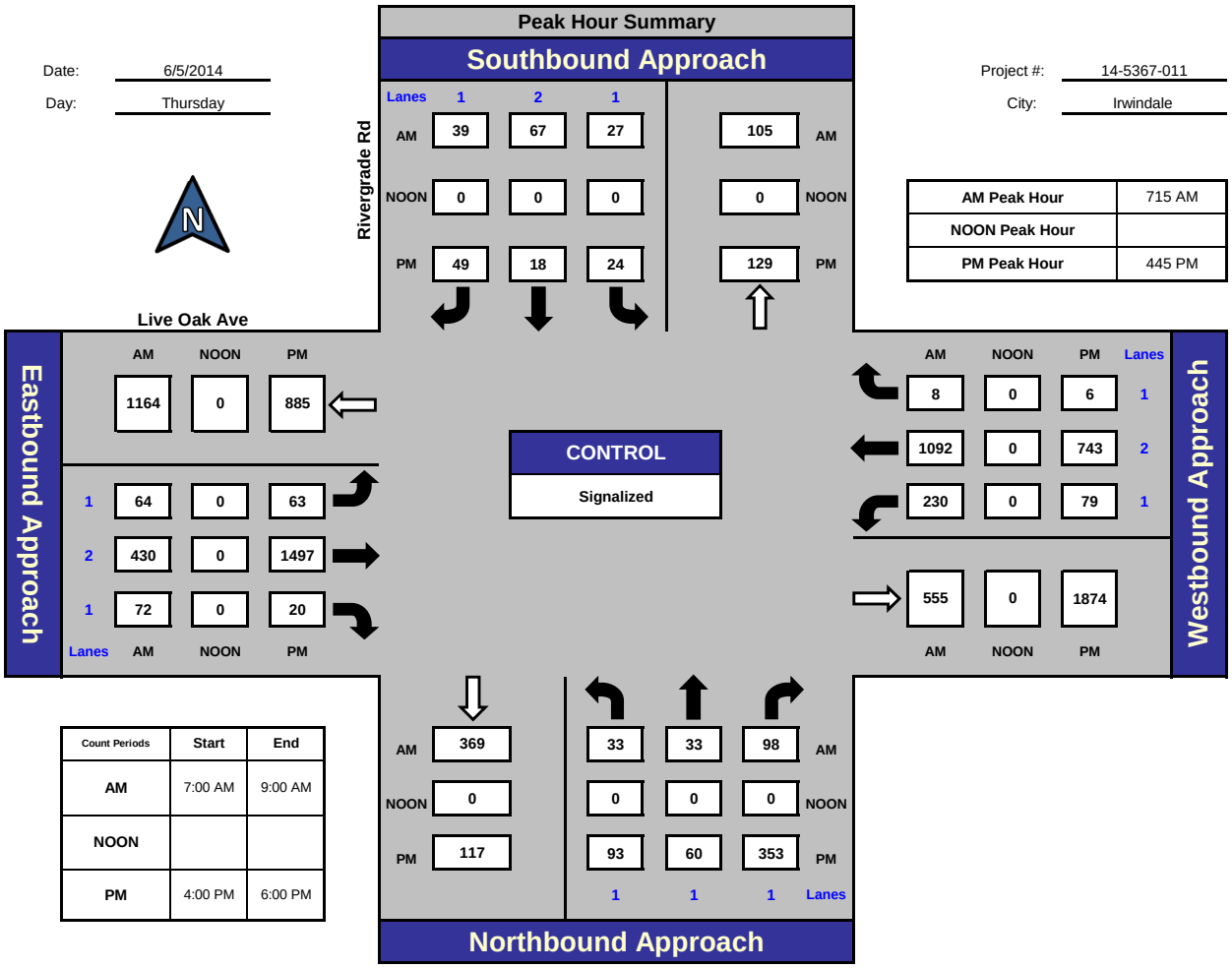
Rivergrade Rd and Live Oak Ave , Irwindale

Date: 6/5/2014
Day: Thursday

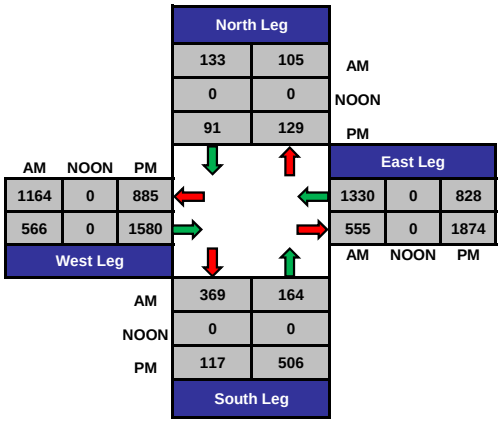
Project #: 14-5367-011
City: Irwindale

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM



Total Ins & Outs



Total Volume Per Leg

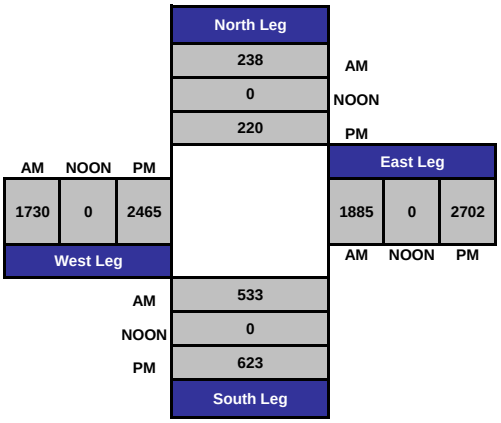


Table C-1 - Existing Peak Hour Volumes

(Intersections With Classification Counts)

	AM Peak Hour						PM Peak Hour					
	Passenger Vehicles	Trucks				Total PCE Volume	Passenger Vehicles	Trucks				Total PCE Volume
		2 Axle	3 Axle	4 Axle	PCE			2 Axle	3 Axle	4 Axle	PCE	
12 Rivergrade Road/Live Oak Avenue												
NBL	28	1	2	2	12	40	91	0	0	2	6	97
NBT	23	3	0	7	26	49	57	1	1	1	7	64
NBR	95	0	0	3	9	104	344	6	1	2	17	361
SBL	26	0	0	1	3	29	23	0	0	1	3	26
SBT	62	2	0	3	12	74	15	2	1	0	5	20
SBR	19	4	3	13	51	70	45	0	0	4	12	57
EBL	49	1	4	10	40	89	54	1	3	5	23	77
EBT	393	9	10	18	88	481	1,447	20	18	12	102	1,549
EBR	66	0	0	6	18	84	20	0	0	0	0	20
WBL	217	2	2	9	34	251	78	0	0	1	3	81
WBT	1,045	13	9	25	113	1,158	725	6	3	9	42	767
WBR	5	1	0	2	8	13	6	0	0	0	0	6
North Leg												
Approach	107	6	3	17	66	173	83	2	1	5	20	103
Departure	77	5	4	19	74	151	117	2	4	6	30	147
Total	184	11	7	36	140	324	200	4	5	11	50	250
South Leg												
Approach	146	4	2	12	47	193	492	7	2	5	30	522
Departure	345	4	2	18	64	409	113	2	1	1	8	121
Total	491	8	4	30	111	602	605	9	3	6	38	643
East Leg												
Approach	1,267	16	11	36	155	1,422	809	6	3	10	45	854
Departure	514	9	10	22	100	614	1,814	26	19	15	122	1,936
Total	1,781	25	21	58	255	2,036	2,623	32	22	25	167	2,790
West Leg												
Approach	508	10	14	34	146	654	1,521	21	21	17	125	1,646
Departure	1,092	18	14	40	176	1,268	861	6	3	15	60	921
Total	1,600	28	28	74	322	1,922	2,382	27	24	32	185	2,567
Total Approaches												
Approach	2,028	36	30	99	414	2,442	2,905	36	27	37	220	3,125
Departure	2,028	36	30	99	414	2,442	2,905	36	27	37	220	3,125
Total	4,056	72	60	198	828	4,884	5,810	72	54	74	440	6,250

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

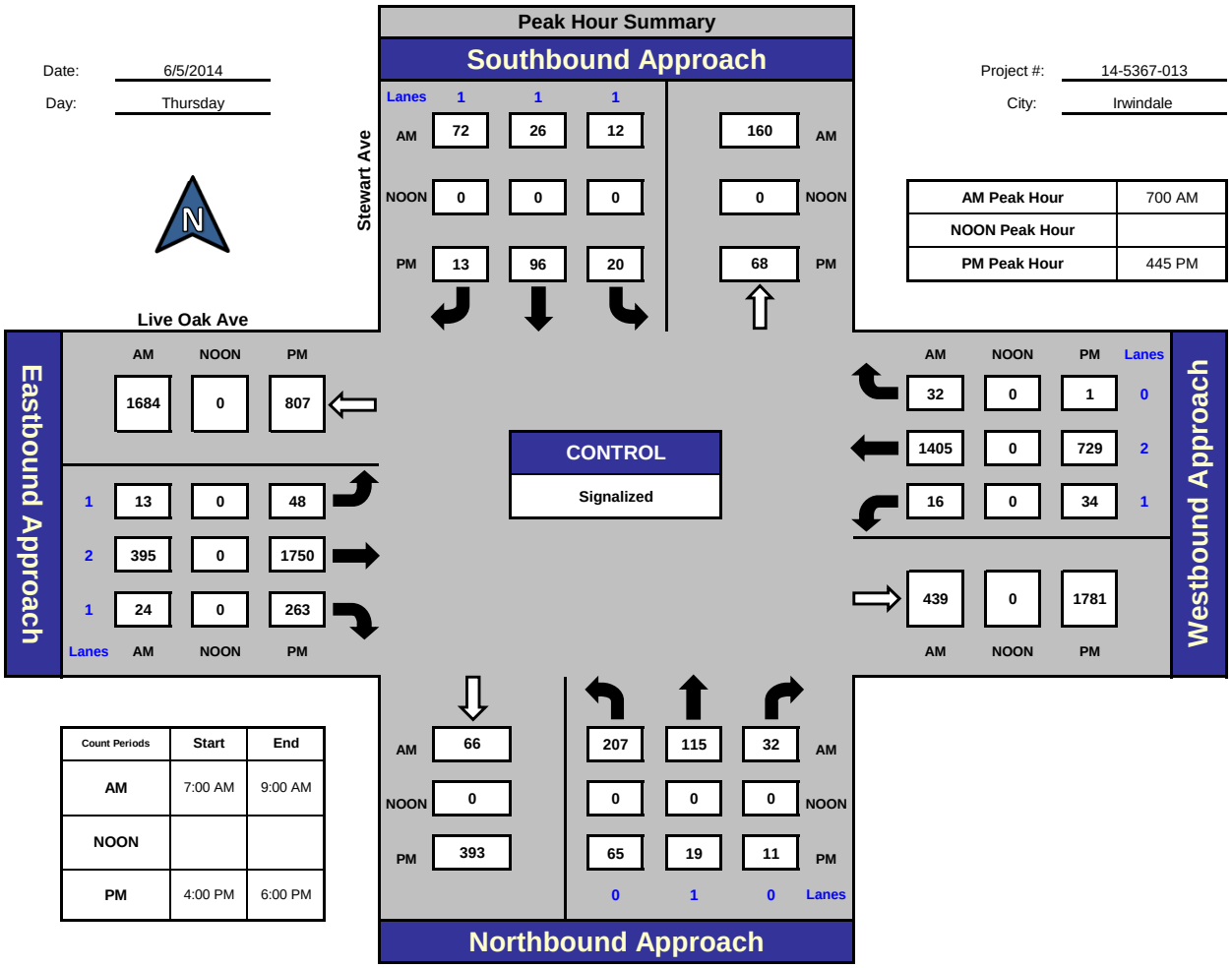
Stewart Ave and Live Oak Ave , Irwindale

Date: 6/5/2014

Day: Thursday

Project #: 14-5367-013

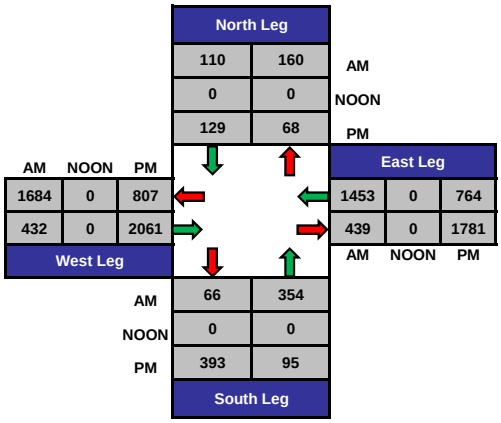
City: Irwindale



AM Peak Hour	700 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg

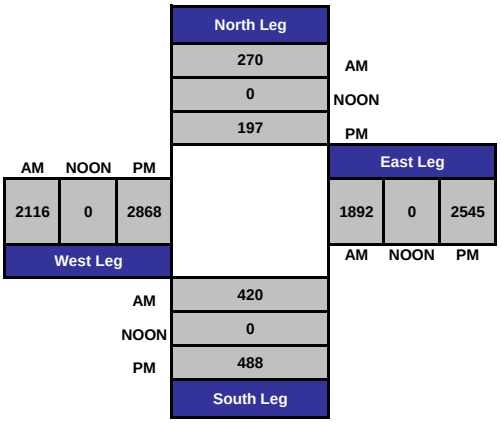


Table C-1 - Existing Peak Hour Volumes

(Intersections With Classification Counts)

	AM Peak Hour						PM Peak Hour					
	Passenger Vehicles	Trucks				Total PCE Volume	Passenger Vehicles	Trucks				Total PCE Volume
		2 Axle	3 Axle	4 Axle	PCE			2 Axle	3 Axle	4 Axle	PCE	
14 Stewart Avenue/Live Oak Avenue												
NBL	203	2	2	0	7	210	62	2	0	1	6	68
NBT	113	1	0	1	5	118	19	0	0	0	0	19
NBR	32	0	0	0	0	32	11	0	0	0	0	11
SBL	11	1	0	0	2	13	18	1	0	1	5	23
SBT	26	0	0	0	0	26	93	1	2	0	6	99
SBR	70	0	0	2	6	76	13	0	0	0	0	13
EBL	16	0	0	1	3	19	58	0	0	0	0	58
EBT	366	14	6	9	60	426	1,684	33	19	14	130	1,814
EBR	22	1	1	0	4	26	261	2	0	0	3	264
WBL	17	0	0	0	0	17	30	0	4	0	8	38
WBT	1,335	16	18	36	168	1,503	709	10	3	7	42	751
WBR	30	0	1	1	5	35	1	0	0	0	0	1
North Leg												
Approach	107	1	0	2	8	115	124	2	2	1	11	135
Departure	159	1	1	3	13	172	78	0	0	0	0	78
Total	266	2	1	5	21	287	202	2	2	1	11	213
South Leg												
Approach	348	3	2	1	12	360	92	2	0	1	6	98
Departure	65	1	1	0	4	69	384	3	6	0	17	401
Total	413	4	3	1	16	429	476	5	6	1	23	499
East Leg												
Approach	1,382	16	19	37	173	1,555	740	10	7	7	50	790
Departure	409	15	6	9	62	471	1,713	34	19	15	135	1,848
Total	1,791	31	25	46	235	2,026	2,453	44	26	22	185	2,638
West Leg												
Approach	404	15	7	10	67	471	2,003	35	19	14	133	2,136
Departure	1,608	18	20	38	181	1,789	784	12	3	8	48	832
Total	2,012	33	27	48	248	2,260	2,787	47	22	22	181	2,968
Total Approaches												
Approach	2,241	35	28	50	260	2,501	2,959	49	28	23	200	3,159
Departure	2,241	35	28	50	260	2,501	2,959	49	28	23	200	3,159
Total	4,482	70	56	100	520	5,002	5,918	98	56	46	400	6,318

ITM Peak Hour Summary

Prepared by:

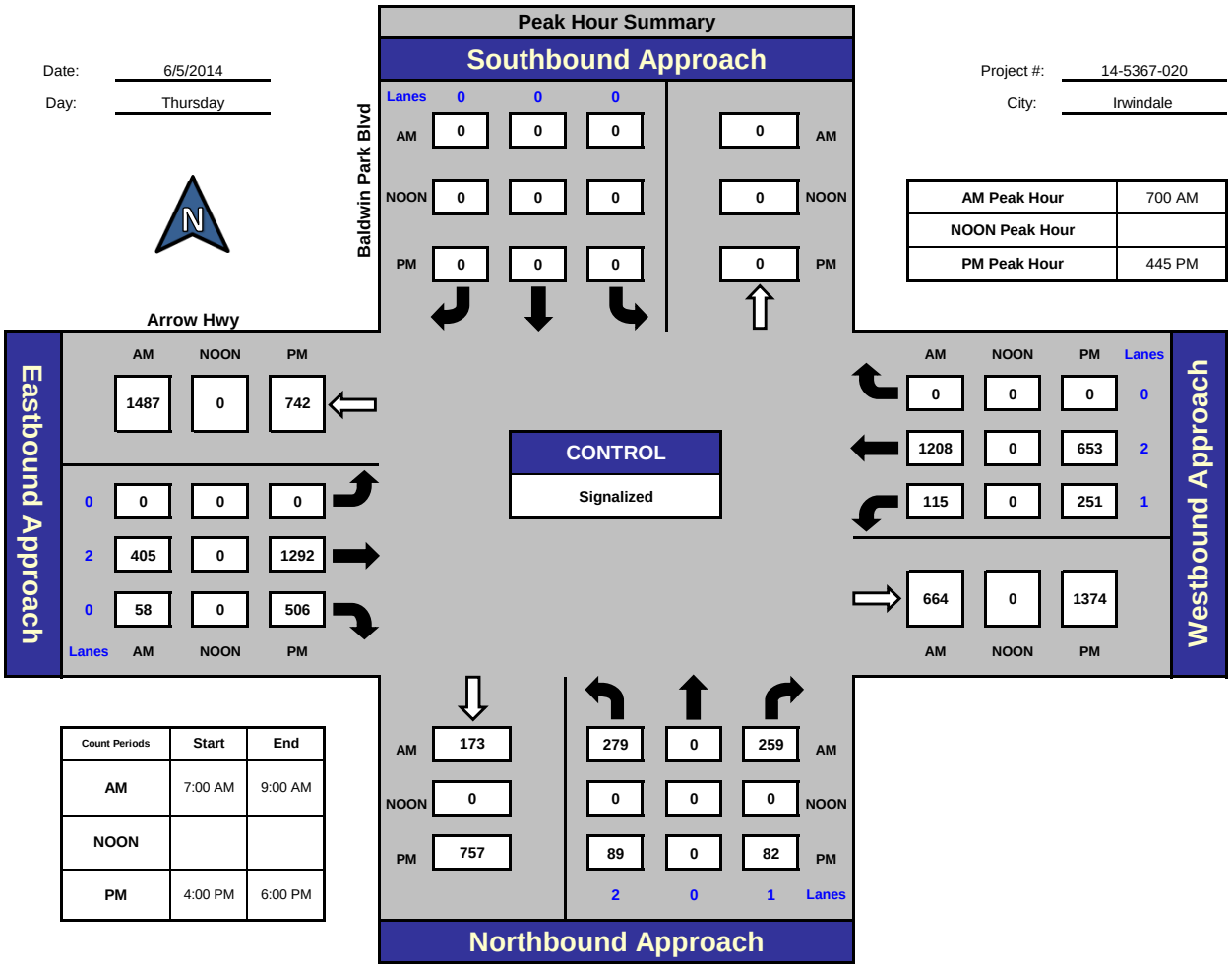
National Data & Surveying Services

Baldwin Park Blvd and Arrow Hwy , Irwindale

Date: 6/5/2014
Day: Thursday

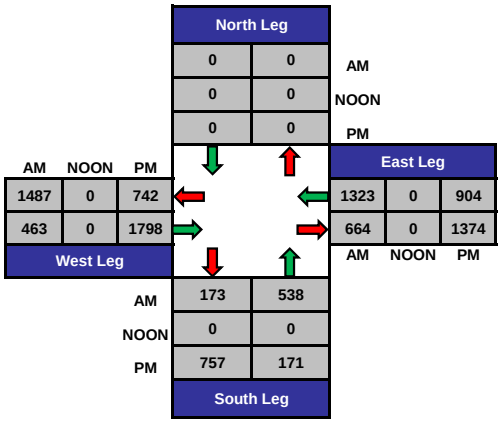
Project #: 14-5367-020
City: Irwindale

AM Peak Hour	700 AM
NOON Peak Hour	
PM Peak Hour	445 PM



Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg

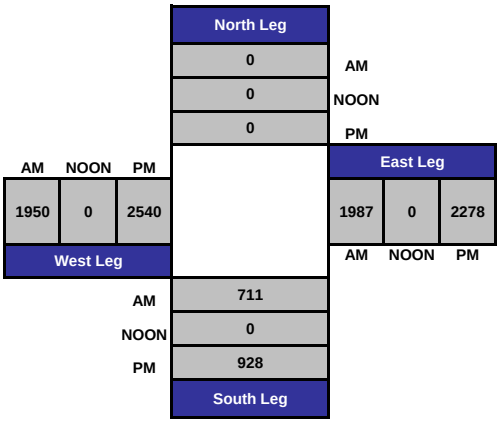


Table C-1 - Existing Peak Hour Volumes

(Intersections With Classification Counts)

	AM Peak Hour						PM Peak Hour					
	Passenger Vehicles	Trucks				Total PCE Volume	Passenger Vehicles	Trucks				Total PCE Volume
		2 Axle	3 Axle	4 Axle	PCE			2 Axle	3 Axle	4 Axle	PCE	
15 Baldwin Park/Arrow Highway												
NBL	264	5	6	4	32	296	85	1	2	1	9	94
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	239	6	0	14	51	290	80	0	2	0	4	84
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	0	0	0	0	0	0	0	0	0	0	0	0
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	382	9	6	8	50	432	1,248	20	9	15	93	1,341
EBR	52	5	0	1	11	63	484	12	10	0	38	522
WBL	108	1	3	5	23	131	252	5	1	0	10	262
WBT	1,148	13	14	33	147	1,295	631	10	5	7	46	677
WBR	0	0	0	0	0	0	0	0	0	0	0	0
North Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
South Leg												
Approach	503	11	6	18	83	586	165	1	4	1	13	178
Departure	160	6	3	6	34	194	736	17	11	0	48	784
Total	663	17	9	24	117	780	901	18	15	1	61	962
East Leg												
Approach	1,256	14	17	38	170	1,426	883	15	6	7	56	939
Departure	621	15	6	22	101	722	1,328	20	11	15	97	1,425
Total	1,877	29	23	60	271	2,148	2,211	35	17	22	153	2,364
West Leg												
Approach	434	14	6	9	61	495	1,732	32	19	15	131	1,863
Departure	1,412	18	20	37	179	1,591	716	11	7	8	55	771
Total	1,846	32	26	46	240	2,086	2,448	43	26	23	186	2,634
Total Approaches												
Approach	2,193	39	29	65	314	2,507	2,780	48	29	23	200	2,980
Departure	2,193	39	29	65	314	2,507	2,780	48	29	23	200	2,980
Total	4,386	78	58	130	628	5,014	5,560	96	58	46	400	5,960

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City of Irwindale
N/S: Arrow Highway
E/W: Live Oak Avenue
Weather: Clear

File Name : IRWARLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

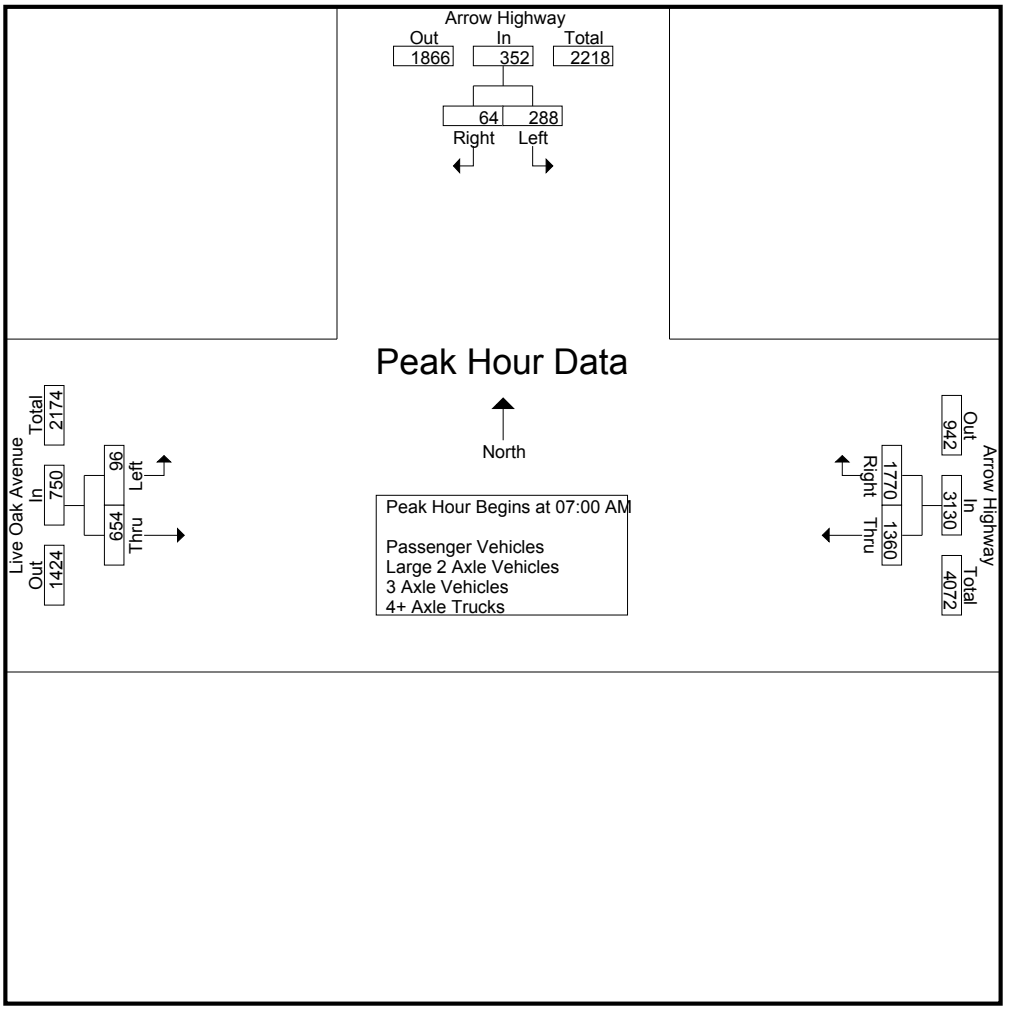
	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	53	13	66	336	432	768	24	108	132	966
07:15 AM	67	12	79	362	489	851	22	141	163	1093
07:30 AM	74	14	88	336	465	801	24	170	194	1083
07:45 AM	94	25	119	326	384	710	26	235	261	1090
Total	288	64	352	1360	1770	3130	96	654	750	4232
08:00 AM	94	20	114	303	360	663	22	151	173	950
08:15 AM	88	24	112	271	284	555	11	176	187	854
08:30 AM	61	20	81	236	258	494	13	148	161	736
08:45 AM	65	8	73	195	208	403	10	180	190	666
Total	308	72	380	1005	1110	2115	56	655	711	3206
Grand Total	596	136	732	2365	2880	5245	152	1309	1461	7438
Apprch %	81.4	18.6		45.1	54.9		10.4	89.6		
Total %	8	1.8	9.8	31.8	38.7	70.5	2	17.6	19.6	
Passenger Vehicles	545	129	674	2202	2791	4993	149	1180	1329	6996
% Passenger Vehicles	91.4	94.9	92.1	93.1	96.9	95.2	98	90.1	91	94.1
Large 2 Axle Vehicles	35	5	40	88	63	151	1	61	62	253
% Large 2 Axle Vehicles	5.9	3.7	5.5	3.7	2.2	2.9	0.7	4.7	4.2	3.4
3 Axle Vehicles	5	2	7	31	13	44	1	23	24	75
% 3 Axle Vehicles	0.8	1.5	1	1.3	0.5	0.8	0.7	1.8	1.6	1
4+ Axle Trucks	11	0	11	44	13	57	1	45	46	114
% 4+ Axle Trucks	1.8	0	1.5	1.9	0.5	1.1	0.7	3.4	3.1	1.5

	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	53	13	66	336	432	768	24	108	132	966
07:15 AM	67	12	79	**362**	**489**	**851**	22	141	163	**1093**
07:30 AM	74	14	88	336	465	801	24	170	194	1083
07:45 AM	**94**	**25**	**119**	326	384	710	**26**	**235**	**261**	1090
Total Volume	288	64	352	1360	1770	3130	96	654	750	4232
% App. Total	81.8	18.2		43.5	56.5		12.8	87.2		
PHF	.766	.640	.739	.939	.905	.920	.923	.696	.718	.968

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Weather: Clear

File Name : IRWARLIAM
Site Code : 05116051
Start Date : 1/27/2016
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			07:00 AM			07:30 AM		
+0 mins.	74	14	88	336	432	768	24	170	194
+15 mins.	**94**	**25**	**119**	**362**	**489**	**851**	**26**	**235**	**261**
+30 mins.	94	20	114	336	465	801	22	151	173
+45 mins.	88	24	112	326	384	710	11	176	187
Total Volume	350	83	433	1360	1770	3130	83	732	815
% App. Total	80.8	19.2		43.5	56.5		10.2	89.8	
PHF	.931	.830	.910	.939	.905	.920	.798	.779	.781

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City of Irwindale
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File Name : IRWARLIAM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- Passenger Vehicles

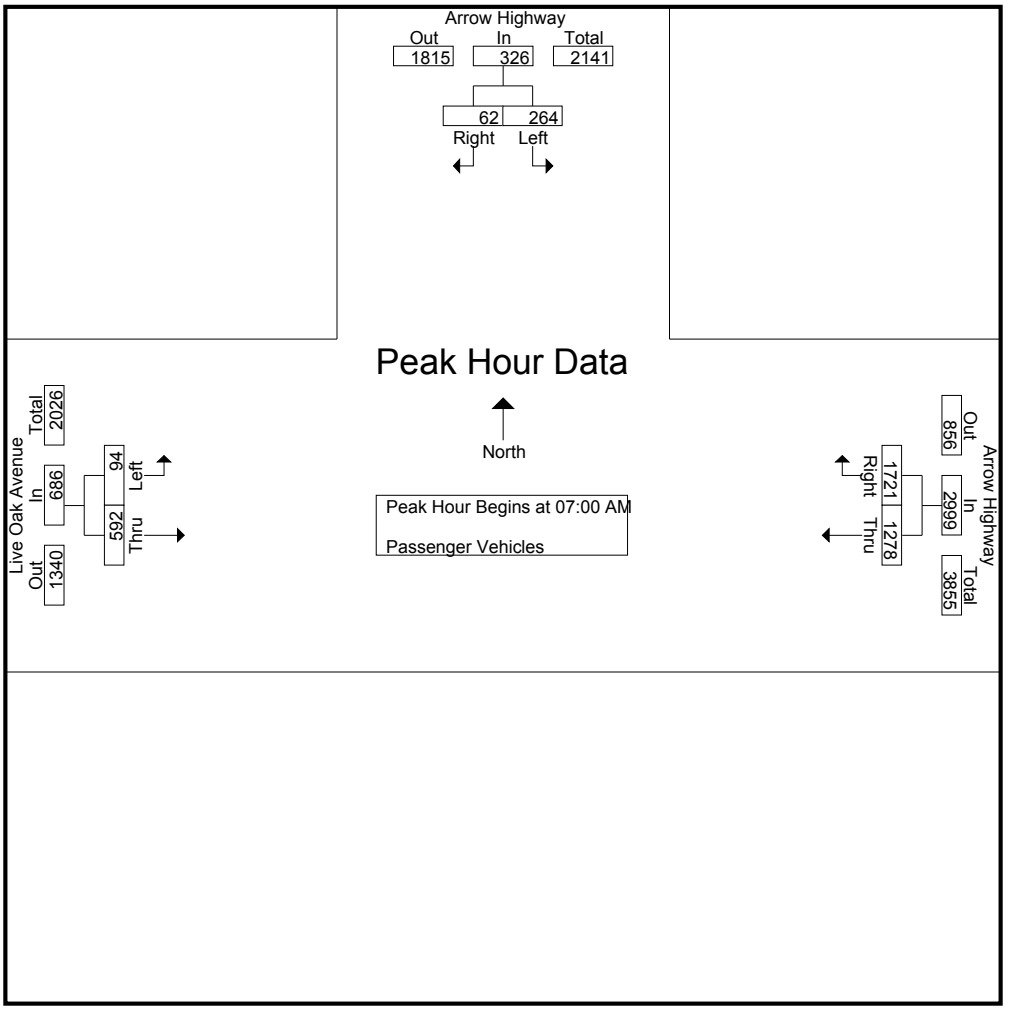
	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	49	13	62	319	410	729	22	88	110	901
07:15 AM	64	12	76	335	482	817	22	131	153	1046
07:30 AM	63	14	77	316	453	769	24	156	180	1026
07:45 AM	88	23	111	308	376	684	26	217	243	1038
Total	264	62	326	1278	1721	2999	94	592	686	4011
08:00 AM	85	18	103	276	347	623	22	137	159	885
08:15 AM	85	23	108	251	275	526	11	159	170	804
08:30 AM	51	18	69	216	248	464	13	128	141	674
08:45 AM	60	8	68	181	200	381	9	164	173	622
Total	281	67	348	924	1070	1994	55	588	643	2985
Grand Total	545	129	674	2202	2791	4993	149	1180	1329	6996
Apprch %	80.9	19.1		44.1	55.9		11.2	88.8		
Total %	7.8	1.8	9.6	31.5	39.9	71.4	2.1	16.9	19	

	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	49	13	62	319	410	729	22	88	110	901
07:15 AM	64	12	76	**335**	**482**	**817**	22	131	153	**1046**
07:30 AM	63	14	77	316	453	769	24	156	180	1026
07:45 AM	**88**	**23**	**111**	308	376	684	**26**	**217**	**243**	1038
Total Volume	264	62	326	1278	1721	2999	94	592	686	4011
% App. Total	81	19		42.6	57.4		13.7	86.3		
PHF	.750	.674	.734	.954	.893	.918	.904	.682	.706	.959

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Site Code : 05116051
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Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	49	13	62	319	410	729	22	88	110
+15 mins.	64	12	76	**335**	**482**	**817**	22	131	153
+30 mins.	63	14	77	316	453	769	24	156	180
+45 mins.	**88**	**23**	**111**	308	376	684	**26**	**217**	**243**
Total Volume	264	62	326	1278	1721	2999	94	592	686
% App. Total	81	19		42.6	57.4		13.7	86.3	
PHF	.750	.674	.734	.954	.893	.918	.904	.682	.706

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City of Irwindale
N/S: Arrow Highway
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File Name : IRWARLIAM
Site Code : 05116051
Start Date : 1/27/2016
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Groups Printed- Large 2 Axle Vehicles

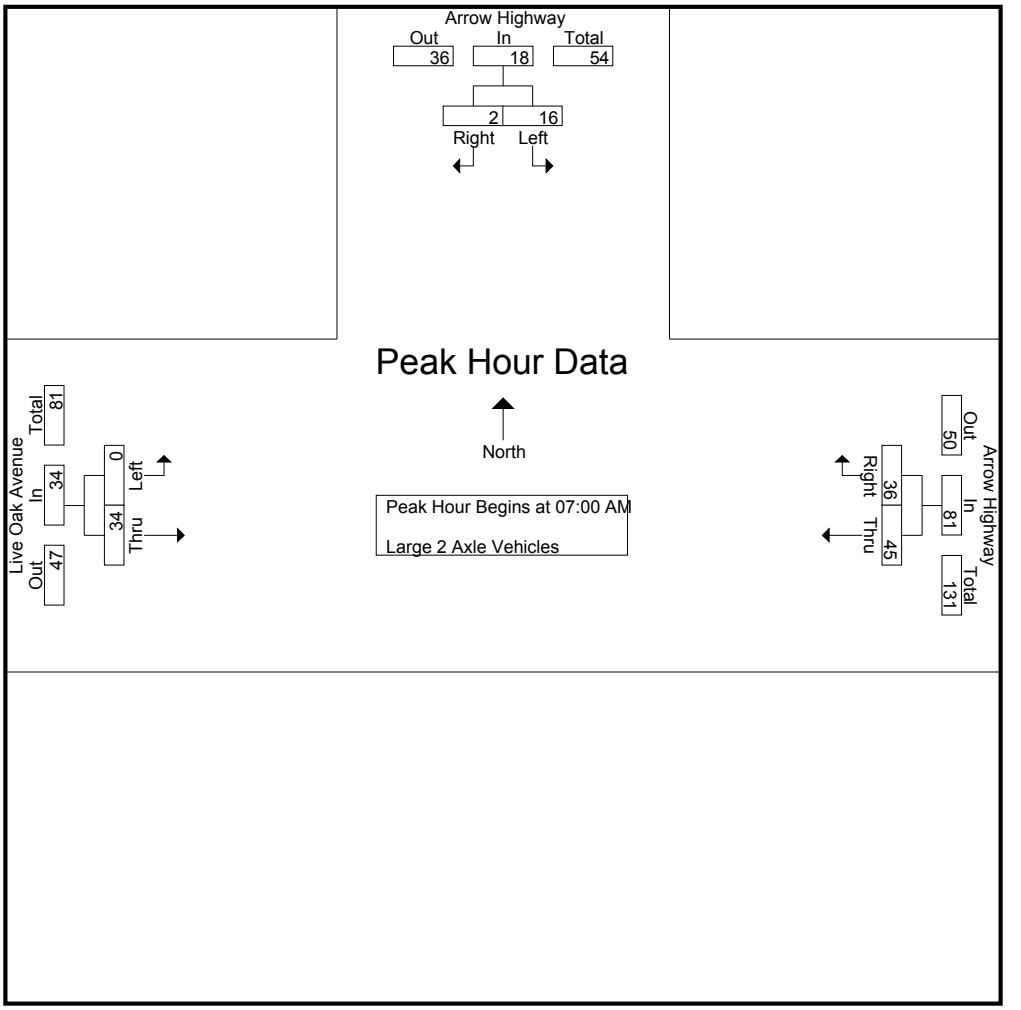
	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	4	0	4	8	18	26	0	8	8	38
07:15 AM	1	0	1	15	6	21	0	5	5	27
07:30 AM	6	0	6	12	7	19	0	8	8	33
07:45 AM	5	2	7	10	5	15	0	13	13	35
Total	16	2	18	45	36	81	0	34	34	133
08:00 AM	8	1	9	13	8	21	0	6	6	36
08:15 AM	3	0	3	10	7	17	0	10	10	30
08:30 AM	5	2	7	12	6	18	0	8	8	33
08:45 AM	3	0	3	8	6	14	1	3	4	21
Total	19	3	22	43	27	70	1	27	28	120
Grand Total	35	5	40	88	63	151	1	61	62	253
Apprch %	87.5	12.5		58.3	41.7		1.6	98.4		
Total %	13.8	2	15.8	34.8	24.9	59.7	0.4	24.1	24.5	

	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	4	0	4	8	**18**	**26**	0	8	8	**38**
07:15 AM	1	0	1	**15**	6	21	0	5	5	27
07:30 AM	**6**	0	6	12	7	19	0	8	8	33
07:45 AM	5	**2**	**7**	10	5	15	0	**13**	**13**	35
Total Volume	16	2	18	45	36	81	0	34	34	133
% App. Total	88.9	11.1		55.6	44.4		0	100		
PHF	.667	.250	.643	.750	.500	.779	.000	.654	.654	.875

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File Name : IRWARLIAM
Site Code : 05116051
Start Date : 1/27/2016
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Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	4	0	4	8	**18**	**26**	0	8	8
+15 mins.	1	0	1	**15**	6	21	0	5	5
+30 mins.	**6**	0	6	12	7	19	0	8	8
+45 mins.	5	**2**	**7**	10	5	15	0	**13**	**13**
Total Volume	16	2	18	45	36	81	0	34	34
% App. Total	88.9	11.1		55.6	44.4		0	100	
PHF	.667	.250	.643	.750	.500	.779	.000	.654	.654

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City of Irwindale
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Groups Printed- 3 Axle Vehicles

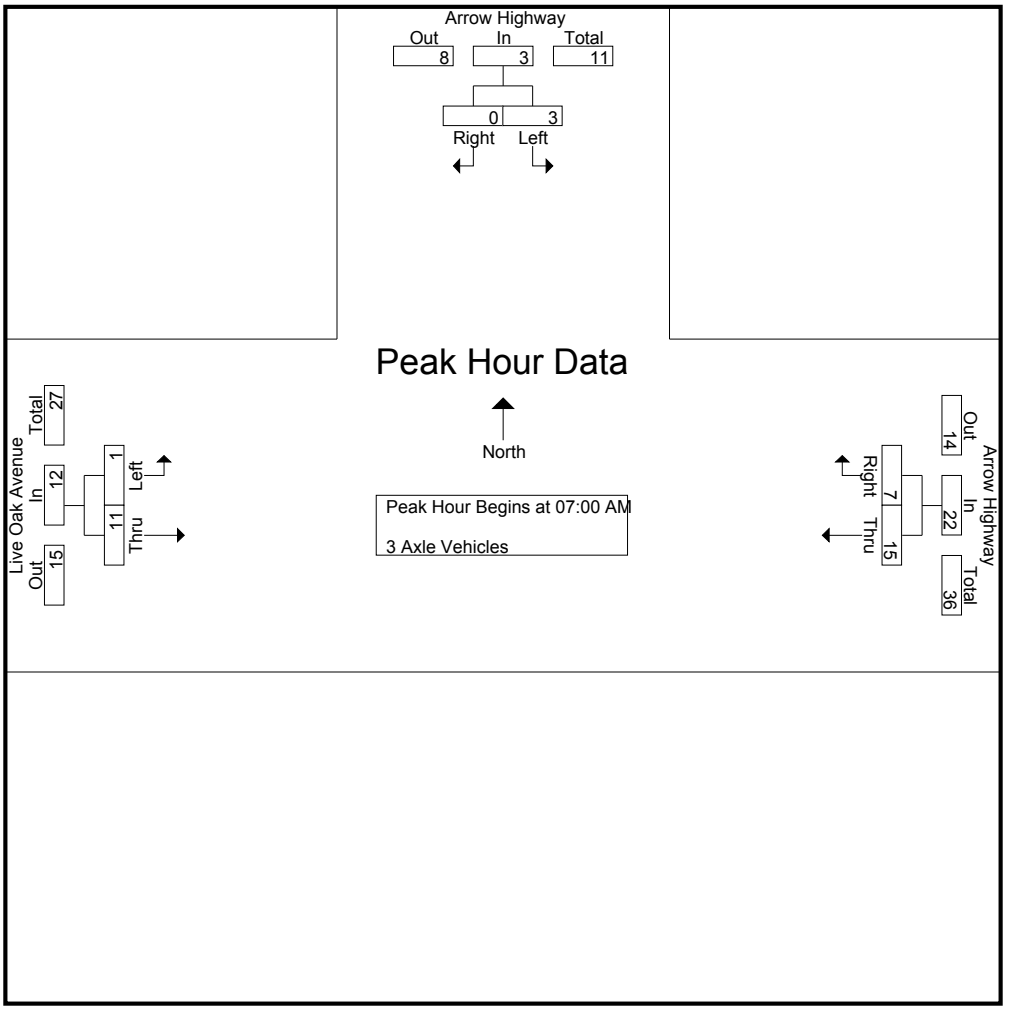
	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	0	0	5	3	8	1	6	7	15
07:15 AM	1	0	1	4	0	4	0	3	3	8
07:30 AM	2	0	2	4	2	6	0	1	1	9
07:45 AM	0	0	0	2	2	4	0	1	1	5
Total	3	0	3	15	7	22	1	11	12	37
08:00 AM	0	1	1	6	2	8	0	5	5	14
08:15 AM	0	1	1	6	0	6	0	3	3	10
08:30 AM	1	0	1	3	3	6	0	3	3	10
08:45 AM	1	0	1	1	1	2	0	1	1	4
Total	2	2	4	16	6	22	0	12	12	38
Grand Total	5	2	7	31	13	44	1	23	24	75
Apprch %	71.4	28.6		70.5	29.5		4.2	95.8		
Total %	6.7	2.7	9.3	41.3	17.3	58.7	1.3	30.7	32	

	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	**5**	**3**	**8**	**1**	**6**	**7**	**15**
07:15 AM	1	0	1	4	0	4	0	3	3	8
07:30 AM	**2**	0	**2**	4	2	6	0	1	1	9
07:45 AM	0	0	0	2	2	4	0	1	1	5
Total Volume	3	0	3	15	7	22	1	11	12	37
% App. Total	100	0		68.2	31.8		8.3	91.7		
PHF	.375	.000	.375	.750	.583	.688	.250	.458	.429	.617

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Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	**5**	**3**	**8**	**1**	**6**	**7**
+15 mins.	1	0	1	4	0	4	0	3	3
+30 mins.	**2**	0	**2**	4	2	6	0	1	1
+45 mins.	0	0	0	2	2	4	0	1	1
Total Volume	3	0	3	15	7	22	1	11	12
% App. Total	100	0		68.2	31.8		8.3	91.7	
PHF	.375	.000	.375	.750	.583	.688	.250	.458	.429

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Groups Printed- 4+ Axle Trucks

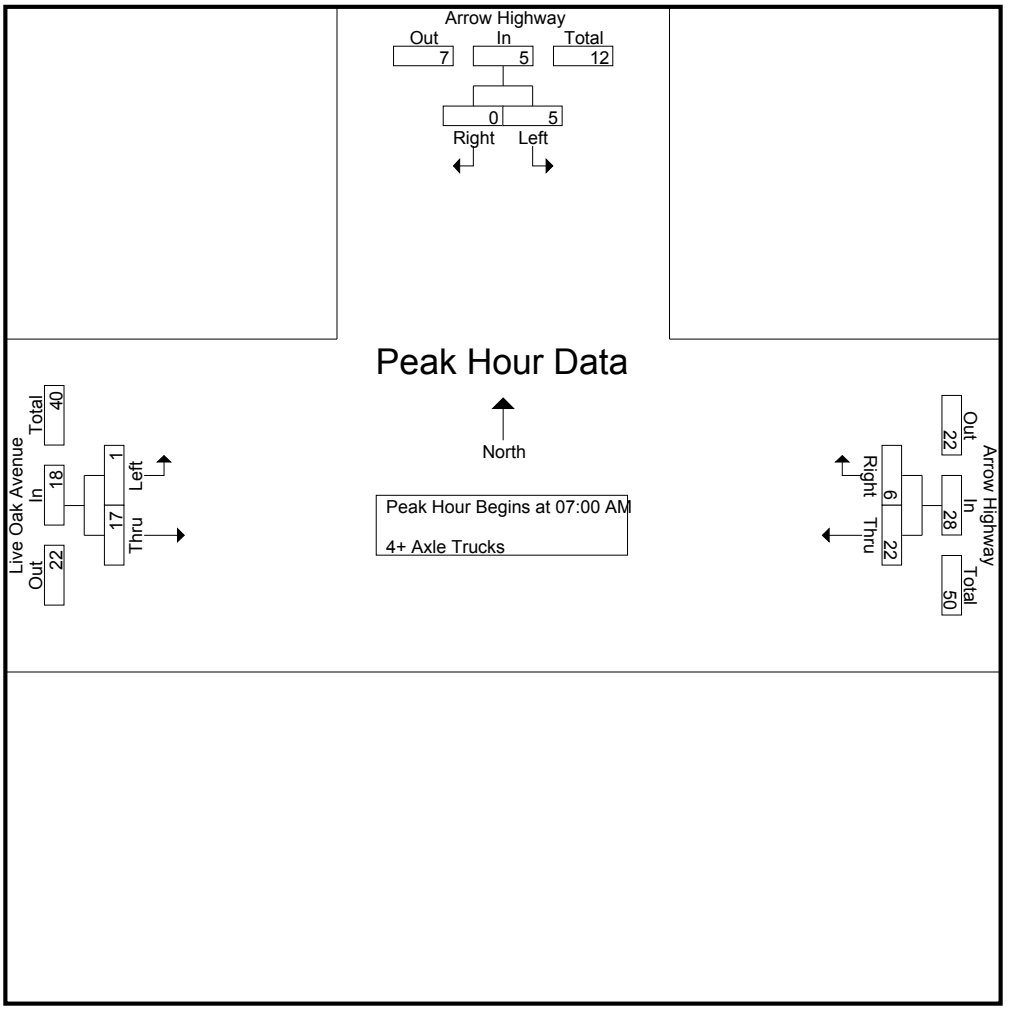
	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	0	0	4	1	5	1	6	7	12
07:15 AM	1	0	1	8	1	9	0	2	2	12
07:30 AM	3	0	3	4	3	7	0	5	5	15
07:45 AM	1	0	1	6	1	7	0	4	4	12
Total	5	0	5	22	6	28	1	17	18	51
08:00 AM	1	0	1	8	3	11	0	3	3	15
08:15 AM	0	0	0	4	2	6	0	4	4	10
08:30 AM	4	0	4	5	1	6	0	9	9	19
08:45 AM	1	0	1	5	1	6	0	12	12	19
Total	6	0	6	22	7	29	0	28	28	63
Grand Total	11	0	11	44	13	57	1	45	46	114
Apprch %	100	0		77.2	22.8		2.2	97.8		
Total %	9.6	0	9.6	38.6	11.4	50	0.9	39.5	40.4	

	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	4	1	5	**1**	**6**	**7**	12
07:15 AM	1	0	1	**8**	1	**9**	0	2	2	12
07:30 AM	**3**	0	**3**	4	**3**	7	0	5	5	**15**
07:45 AM	1	0	1	6	1	7	0	4	4	12
Total Volume	5	0	5	22	6	28	1	17	18	51
% App. Total	100	0		78.6	21.4		5.6	94.4		
PHF	.417	.000	.417	.688	.500	.778	.250	.708	.643	.850

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Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	4	1	5	**1**	**6**	**7**
+15 mins.	1	0	1	**8**	1	**9**	0	2	2
+30 mins.	**3**	0	**3**	4	**3**	7	0	5	5
+45 mins.	1	0	1	6	1	7	0	4	4
Total Volume	5	0	5	22	6	28	1	17	18
% App. Total	100	0		78.6	21.4		5.6	94.4	
PHF	.417	.000	.417	.688	.500	.778	.250	.708	.643

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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

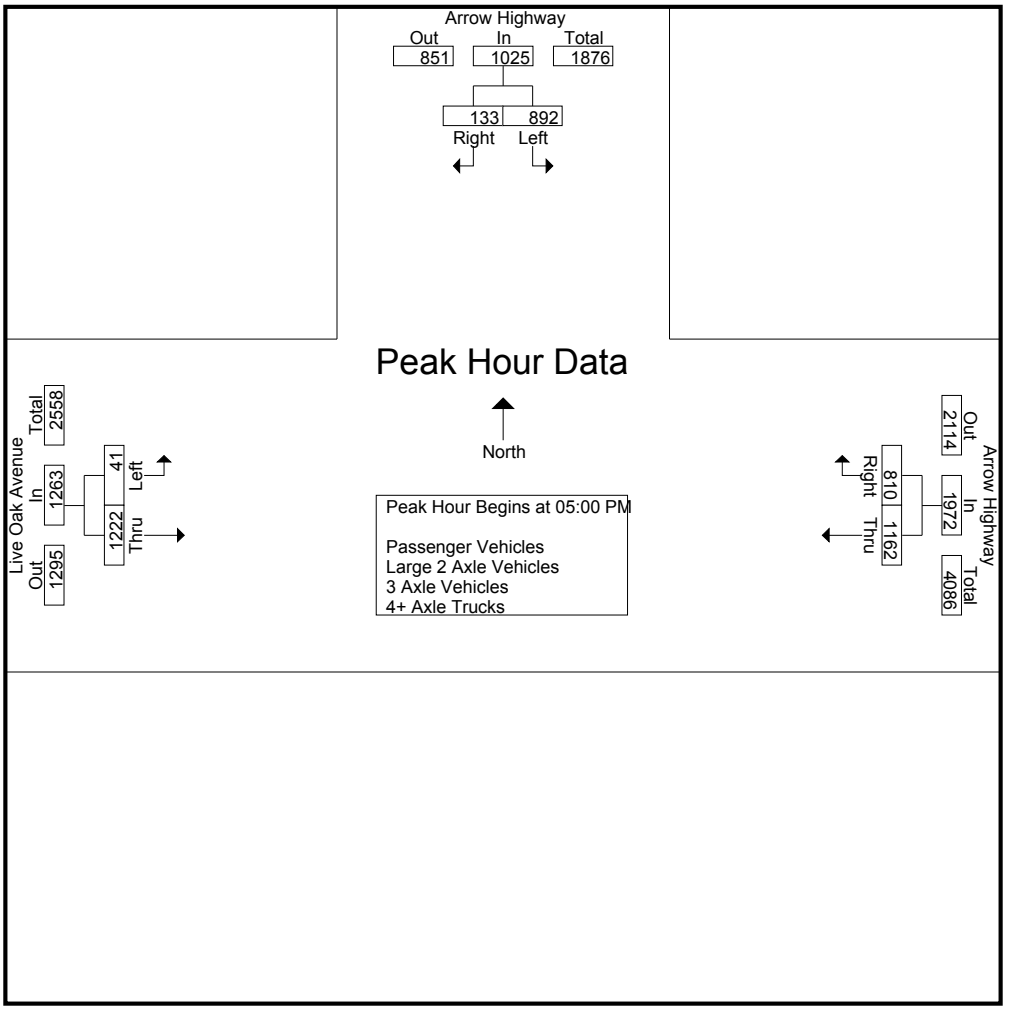
	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	234	17	251	224	148	372	12	330	342	965
04:15 PM	216	26	242	204	107	311	10	339	349	902
04:30 PM	241	25	266	228	122	350	6	333	339	955
04:45 PM	244	28	272	253	151	404	15	314	329	1005
Total	935	96	1031	909	528	1437	43	1316	1359	3827
05:00 PM	246	31	277	298	178	476	10	329	339	1092
05:15 PM	193	33	226	272	207	479	13	294	307	1012
05:30 PM	217	34	251	330	199	529	12	311	323	1103
05:45 PM	236	35	271	262	226	488	6	288	294	1053
Total	892	133	1025	1162	810	1972	41	1222	1263	4260
Grand Total	1827	229	2056	2071	1338	3409	84	2538	2622	8087
Apprch %	88.9	11.1		60.8	39.2		3.2	96.8		
Total %	22.6	2.8	25.4	25.6	16.5	42.2	1	31.4	32.4	
Passenger Vehicles	1761	225	1986	1931	1275	3206	80	2409	2489	7681
% Passenger Vehicles	96.4	98.3	96.6	93.2	95.3	94	95.2	94.9	94.9	95
Large 2 Axle Vehicles	44	3	47	72	26	98	0	76	76	221
% Large 2 Axle Vehicles	2.4	1.3	2.3	3.5	1.9	2.9	0	3	2.9	2.7
3 Axle Vehicles	19	0	19	29	30	59	3	32	35	113
% 3 Axle Vehicles	1	0	0.9	1.4	2.2	1.7	3.6	1.3	1.3	1.4
4+ Axle Trucks	3	1	4	39	7	46	1	21	22	72
% 4+ Axle Trucks	0.2	0.4	0.2	1.9	0.5	1.3	1.2	0.8	0.8	0.9

	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	**246**	31	**277**	298	178	476	10	**329**	**339**	1092
05:15 PM	193	33	226	272	207	479	**13**	294	307	1012
05:30 PM	217	34	251	**330**	199	**529**	12	311	323	**1103**
05:45 PM	236	**35**	271	262	**226**	488	6	288	294	1053
Total Volume	892	133	1025	1162	810	1972	41	1222	1263	4260
% App. Total	87	13		58.9	41.1		3.2	96.8		
PHF	.907	.950	.925	.880	.896	.932	.788	.929	.931	.966

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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			05:00 PM			04:00 PM		
+0 mins.	216	26	242	298	178	476	12	330	342
+15 mins.	241	25	266	272	207	479	10	**339**	**349**
+30 mins.	244	28	272	**330**	199	**529**	6	333	339
+45 mins.	**246**	**31**	**277**	262	**226**	488	**15**	314	329
Total Volume	947	110	1057	1162	810	1972	43	1316	1359
% App. Total	89.6	10.4		58.9	41.1		3.2	96.8	
PHF	.962	.887	.954	.880	.896	.932	.717	.971	.973

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Groups Printed- Passenger Vehicles

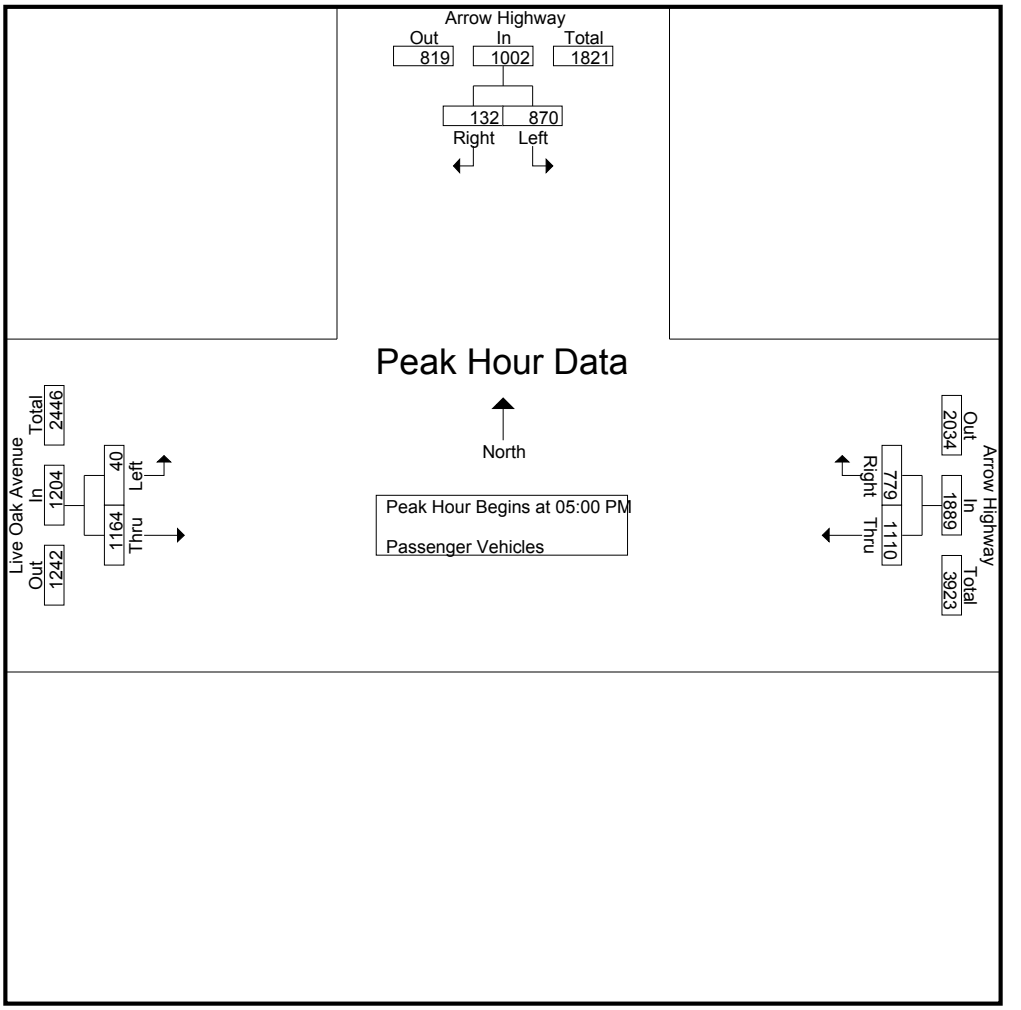
	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	221	17	238	206	133	339	12	314	326	903
04:15 PM	206	26	232	174	104	278	9	312	321	831
04:30 PM	224	23	247	210	115	325	5	317	322	894
04:45 PM	240	27	267	231	144	375	14	302	316	958
Total	891	93	984	821	496	1317	40	1245	1285	3586
05:00 PM	242	30	272	290	170	460	9	308	317	1049
05:15 PM	188	33	221	251	198	449	13	283	296	966
05:30 PM	212	34	246	315	193	508	12	300	312	1066
05:45 PM	228	35	263	254	218	472	6	273	279	1014
Total	870	132	1002	1110	779	1889	40	1164	1204	4095
Grand Total	1761	225	1986	1931	1275	3206	80	2409	2489	7681
Apprch %	88.7	11.3		60.2	39.8		3.2	96.8		
Total %	22.9	2.9	25.9	25.1	16.6	41.7	1	31.4	32.4	

	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	**242**	30	**272**	290	170	460	9	**308**	**317**	1049
05:15 PM	188	33	221	251	198	449	**13**	283	296	966
05:30 PM	212	34	246	**315**	193	**508**	12	300	312	**1066**
05:45 PM	228	**35**	263	254	**218**	472	6	273	279	1014
Total Volume	870	132	1002	1110	779	1889	40	1164	1204	4095
% App. Total	86.8	13.2		58.8	41.2		3.3	96.7		
PHF	.899	.943	.921	.881	.893	.930	.769	.945	.950	.960

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Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	**242**	30	**272**	290	170	460	9	**308**	**317**
+15 mins.	188	33	221	251	198	449	**13**	283	296
+30 mins.	212	34	246	**315**	193	**508**	12	300	312
+45 mins.	228	**35**	263	254	**218**	472	6	273	279
Total Volume	870	132	1002	1110	779	1889	40	1164	1204
% App. Total	86.8	13.2		58.8	41.2		3.3	96.7	
PHF	.899	.943	.921	.881	.893	.930	.769	.945	.950

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Groups Printed- Large 2 Axle Vehicles

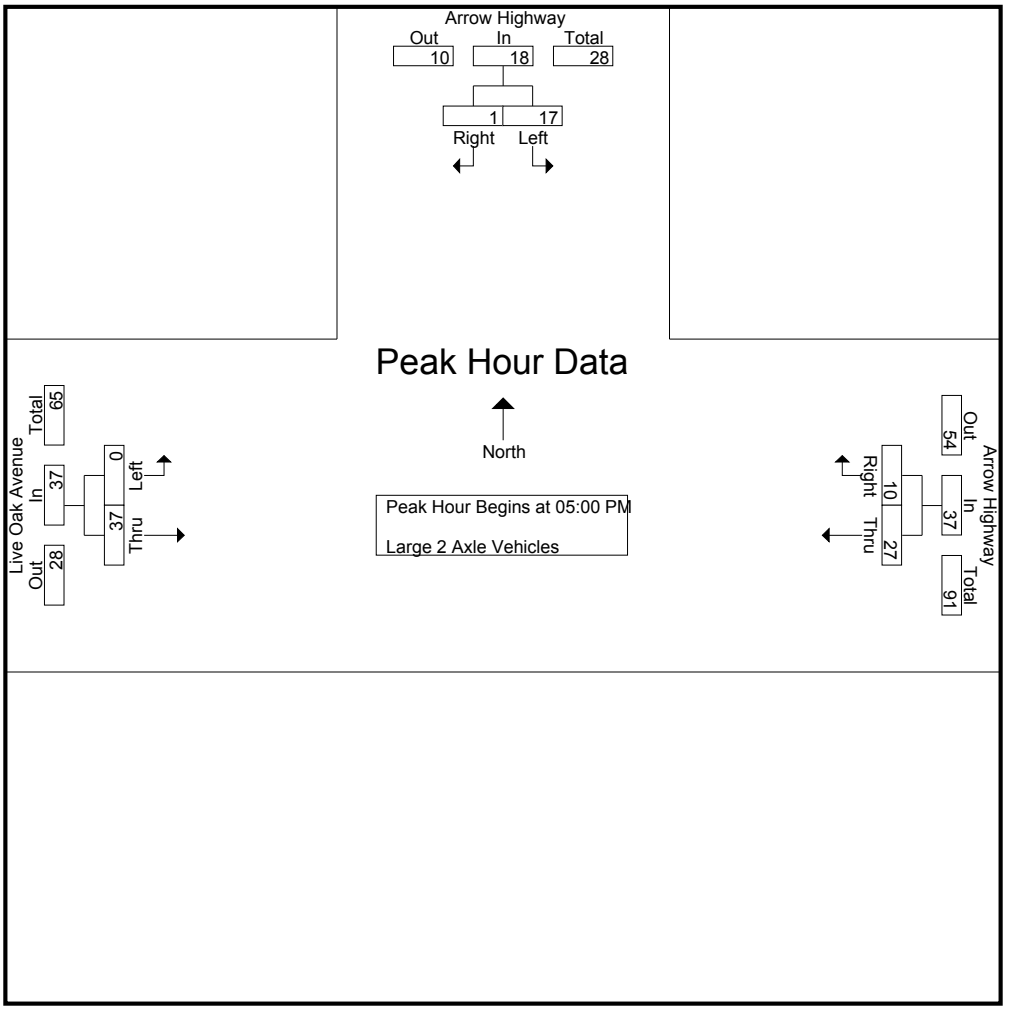
	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	12	0	12	6	7	13	0	8	8	33
04:15 PM	7	0	7	19	1	20	0	16	16	43
04:30 PM	6	2	8	9	2	11	0	9	9	28
04:45 PM	2	0	2	11	6	17	0	6	6	25
Total	27	2	29	45	16	61	0	39	39	129
05:00 PM	2	1	3	3	4	7	0	12	12	22
05:15 PM	4	0	4	12	2	14	0	9	9	27
05:30 PM	4	0	4	7	1	8	0	8	8	20
05:45 PM	7	0	7	5	3	8	0	8	8	23
Total	17	1	18	27	10	37	0	37	37	92
Grand Total	44	3	47	72	26	98	0	76	76	221
Apprch %	93.6	6.4		73.5	26.5		0	100		
Total %	19.9	1.4	21.3	32.6	11.8	44.3	0	34.4	34.4	

	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	2	**1**	3	3	**4**	7	0	**12**	**12**	22
05:15 PM	4	0	4	**12**	2	**14**	0	9	9	**27**
05:30 PM	4	0	4	7	1	8	0	8	8	20
05:45 PM	**7**	0	**7**	5	3	8	0	8	8	23
Total Volume	17	1	18	27	10	37	0	37	37	92
% App. Total	94.4	5.6		73	27		0	100		
PHF	.607	.250	.643	.563	.625	.661	.000	.771	.771	.852

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Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	2	**1**	3	3	**4**	7	0	**12**	**12**
+15 mins.	4	0	4	**12**	2	**14**	0	9	9
+30 mins.	4	0	4	7	1	8	0	8	8
+45 mins.	**7**	0	**7**	5	3	8	0	8	8
Total Volume	17	1	18	27	10	37	0	37	37
% App. Total	94.4	5.6		73	27		0	100	
PHF	.607	.250	.643	.563	.625	.661	.000	.771	.771

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Groups Printed- 3 Axle Vehicles

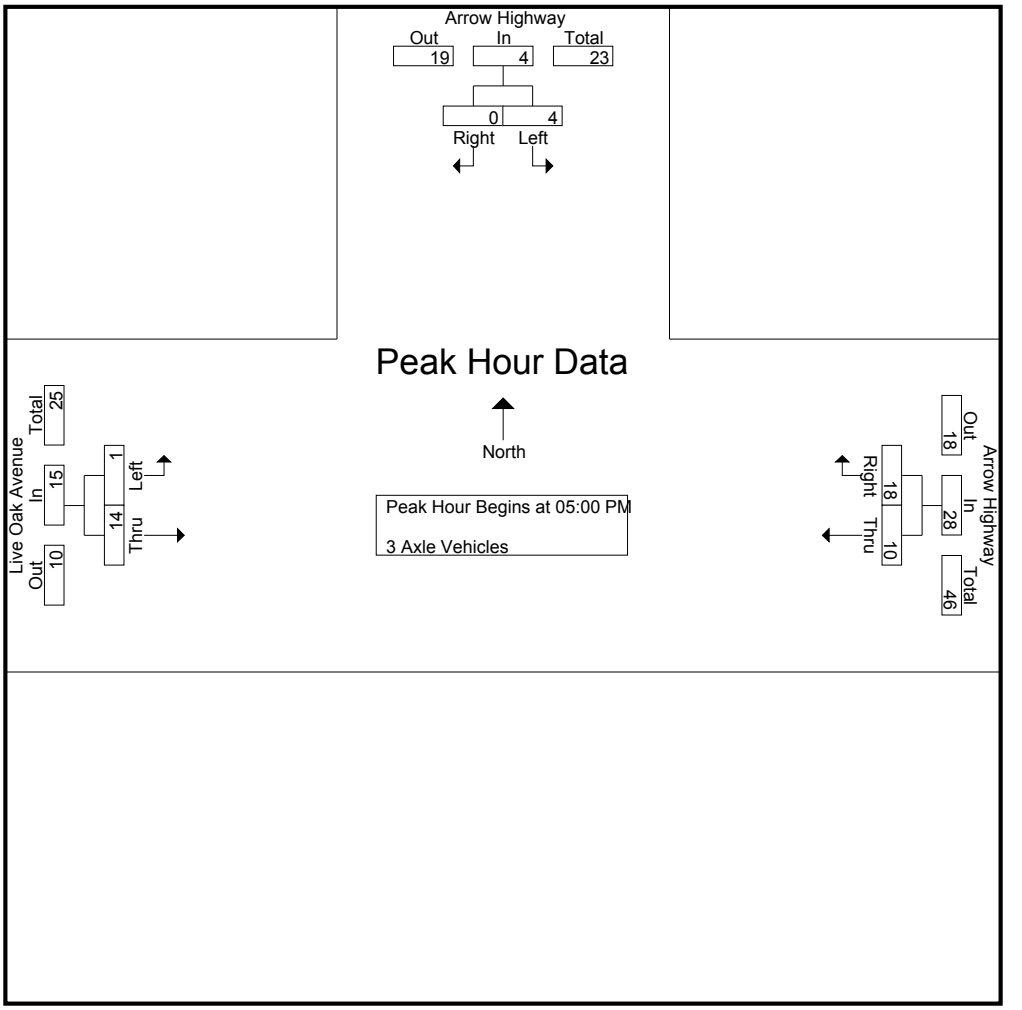
	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	1	0	1	9	4	13	0	6	6	20
04:15 PM	2	0	2	5	2	7	1	6	7	16
04:30 PM	10	0	10	3	5	8	1	3	4	22
04:45 PM	2	0	2	2	1	3	0	3	3	8
Total	15	0	15	19	12	31	2	18	20	66
05:00 PM	2	0	2	1	3	4	1	7	8	14
05:15 PM	0	0	0	4	6	10	0	1	1	11
05:30 PM	1	0	1	4	5	9	0	2	2	12
05:45 PM	1	0	1	1	4	5	0	4	4	10
Total	4	0	4	10	18	28	1	14	15	47
Grand Total	19	0	19	29	30	59	3	32	35	113
Apprch %	100	0		49.2	50.8		8.6	91.4		
Total %	16.8	0	16.8	25.7	26.5	52.2	2.7	28.3	31	

	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	**2**	0	**2**	1	3	4	**1**	**7**	**8**	**14**
05:15 PM	0	0	0	**4**	**6**	**10**	0	1	1	11
05:30 PM	1	0	1	4	5	9	0	2	2	12
05:45 PM	1	0	1	1	4	5	0	4	4	10
Total Volume	4	0	4	10	18	28	1	14	15	47
% App. Total	100	0		35.7	64.3		6.7	93.3		
PHF	.500	.000	.500	.625	.750	.700	.250	.500	.469	.839

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Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	**2**	0	**2**	1	3	4	**1**	**7**	**8**
+15 mins.	0	0	0	**4**	**6**	**10**	0	1	1
+30 mins.	1	0	1	4	5	9	0	2	2
+45 mins.	1	0	1	1	4	5	0	4	4
Total Volume	4	0	4	10	18	28	1	14	15
% App. Total	100	0		35.7	64.3		6.7	93.3	
PHF	.500	.000	.500	.625	.750	.700	.250	.500	.469

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Irwindale
N/S: Arrow Highway
E/W: Live Oak Avenue
Weather: Clear

File Name : IRWARLIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 1

Groups Printed- 4+ Axle Trucks

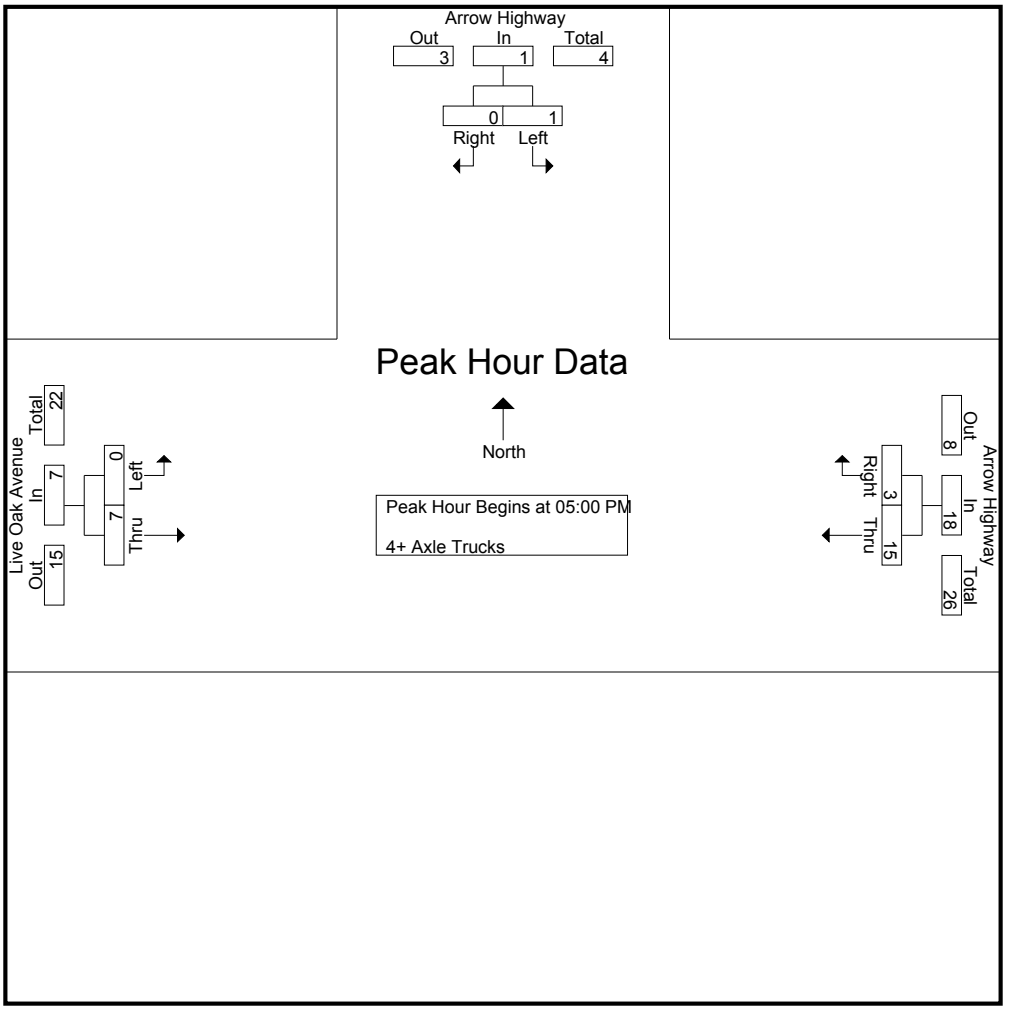
	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	0	0	0	3	4	7	0	2	2	9
04:15 PM	1	0	1	6	0	6	0	5	5	12
04:30 PM	1	0	1	6	0	6	0	4	4	11
04:45 PM	0	1	1	9	0	9	1	3	4	14
Total	2	1	3	24	4	28	1	14	15	46
05:00 PM	0	0	0	4	1	5	0	2	2	7
05:15 PM	1	0	1	5	1	6	0	1	1	8
05:30 PM	0	0	0	4	0	4	0	1	1	5
05:45 PM	0	0	0	2	1	3	0	3	3	6
Total	1	0	1	15	3	18	0	7	7	26
Grand Total	3	1	4	39	7	46	1	21	22	72
Apprch %	75	25		84.8	15.2		4.5	95.5		
Total %	4.2	1.4	5.6	54.2	9.7	63.9	1.4	29.2	30.6	

	Arrow Highway Southbound			Arrow Highway Westbound			Live Oak Avenue Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	4	**1**	5	0	2	2	7
05:15 PM	**1**	0	**1**	**5**	1	**6**	0	1	1	**8**
05:30 PM	0	0	0	4	0	4	0	1	1	5
05:45 PM	0	0	0	2	1	3	0	**3**	**3**	6
Total Volume	1	0	1	15	3	18	0	7	7	26
% App. Total	100	0		83.3	16.7		0	100		
PHF	.250	.000	.250	.750	.750	.750	.000	.583	.583	.813

Counts Unlimited
PO Box 1178
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City of Irwindale
N/S: Arrow Highway
E/W: Live Oak Avenue
Weather: Clear

File Name : IRWARLIPM
Site Code : 05116051
Start Date : 1/27/2016
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	0	0	0	4	**1**	5	0	2	2
+15 mins.	**1**	0	**1**	**5**	1	**6**	0	1	1
+30 mins.	0	0	0	4	0	4	0	1	1
+45 mins.	0	0	0	2	1	3	0	**3**	**3**
Total Volume	1	0	1	15	3	18	0	7	7
% App. Total	100	0		83.3	16.7		0	100	
PHF	.250	.000	.250	.750	.750	.750	.000	.583	.583

Existing (2016) PCE Conversion

14. Arrow Hwy. / Live Oak Av.

	AM PEAK HOUR												AM TOTAL	PM PEAK HOUR											PM TOTAL
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
Existing (2016)																										
- Passenger Vehicles	0	0	0	264	0	62	94	592	0	0	1,278	1,721	4,011	0	0	0	870	0	132	40	1,164	0	0	1,110	779	4,095
- 2-Axle Trucks	0	0	0	16	0	2	0	34	0	0	45	36	133	0	0	0	17	0	1	0	37	0	0	27	10	92
- 3-Axle Trucks	0	0	0	3	0	0	1	11	0	0	15	7	37	0	0	0	4	0	0	1	14	0	0	10	18	47
- 4-Axle or more Trucks	0	0	0	5	0	0	1	17	0	0	22	6	51	0	0	0	1	0	0	0	7	0	0	15	3	26
Total Existing (2016) Actual Vehicles	0	0	0	288	0	64	96	654	0	0	1,360	1,770	4,232	0	0	0	892	0	133	41	1,222	0	0	1,162	810	4,260
Passenger Car Equivalent (PCE)																										
- Passenger Vehicles	0	0	0	264	0	62	94	592	0	0	1,278	1,721	4,011	0	0	0	870	0	132	40	1,164	0	0	1,110	779	4,095
- 2-Axle Trucks (PCE Factor = 1.5)	0	0	0	24	0	3	0	51	0	0	68	54	200	0	0	0	26	0	2	0	56	0	0	41	15	140
- 3-Axle Trucks (PCE Factor = 2.0)	0	0	0	6	0	0	2	22	0	0	30	14	74	0	0	0	8	0	0	2	28	0	0	20	36	94
- 4-Axle or more (PCE Factor = 3.0)	0	0	0	15	0	0	3	51	0	0	66	18	153	0	0	0	3	0	0	0	21	0	0	45	9	78
Total Existing (2016) PCE	0	0	0	309	0	65	99	716	0	0	1,442	1,807	4,438	0	0	0	907	0	134	42	1,269	0	0	1,216	839	4,407

	South Leg			North Leg			West Leg			East Leg				South Leg			North Leg			West Leg			East Leg			
Link Volumes	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total		IN	OUT	Total	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total	
Total Existing (2016) Actual Vehicles	0	0	0	352	1,866	2,218	750	1,424	2,174	3,130	942	4,072		0	0	0	1,025	851	1,876	1,263	1,295	2,558	1,972	2,114	4,086	
Total Existing (2016) PCE	0	0	0	374	1,906	2,280	815	1,507	2,322	3,249	1,025	4,274		0	0	0	1,041	881	1,922	1,311	1,350	2,661	2,055	2,176	4,231	

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ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Maine Ave and Arrow Hwy , Irwindale

Date: 6/5/2014
Day: Thursday

Project #: 14-5367-019
City: Irwindale

AM Peak Hour	700 AM
NOON Peak Hour	
PM Peak Hour	430 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
AM	0	0	AM
NOON	0	0	NOON
PM	0	0	PM

West Leg				East Leg		
AM	NOON	PM		AM	NOON	PM
2814	0	1216		2246	0	1039
772	0	2285		778	0	1899

	South Leg	
AM	124	698
NOON	0	0
PM	544	335

Total Volume Per Leg

	North Leg	
AM	0	AM
NOON	0	NOON
PM	0	PM

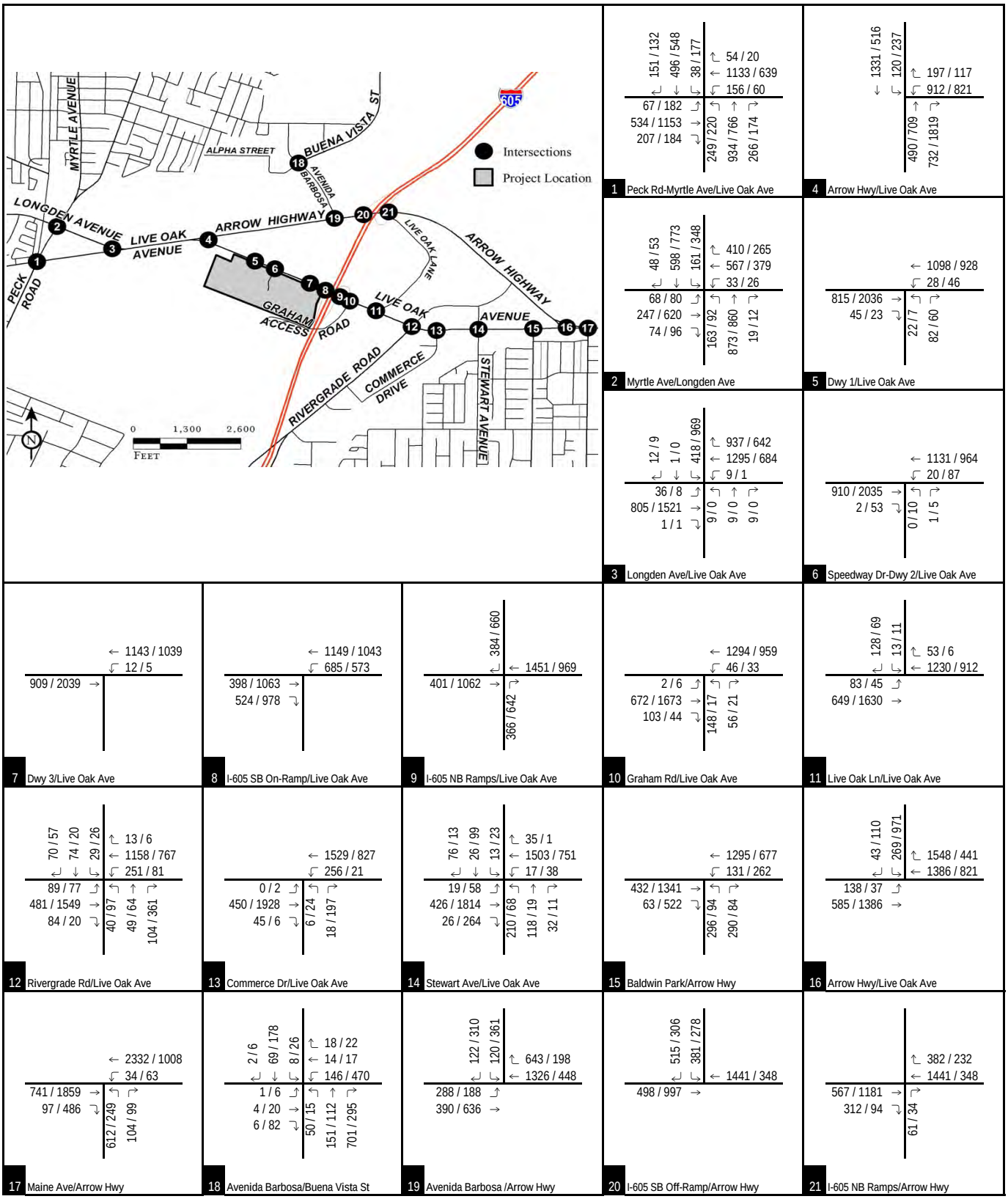
West Leg			East Leg		
AM	NOON	PM	AM	NOON	PM
3586	0	3501	3024	0	2938

	South Leg
AM	822
NOON	0
PM	879

Table C-1 - Existing Peak Hour Volumes

(Intersections With Classification Counts)

	AM Peak Hour						PM Peak Hour					
	Passenger Vehicles	Trucks 2 Axle	Trucks 3 Axle	Trucks 4 Axle	Trucks PCE	Total PCE Volume	Passenger Vehicles	Trucks 2 Axle	Trucks 3 Axle	Trucks 4 Axle	Trucks PCE	Total PCE Volume
17 Maine Avenue/Arrow Highway												
NBL	582	12	6	0	30	612	231	2	3	3	18	249
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	93	2	1	2	11	104	92	2	2	0	7	99
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	0	0	0	0	0	0	0	0	0	0	0	0
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	632	19	7	22	109	741	1,749	26	13	15	110	1,859
EBR	85	4	3	0	12	97	479	1	1	1	7	486
WBL	29	3	0	0	5	34	61	1	0	0	2	63
WBT	2,132	23	12	47	200	2,332	951	11	5	10	57	1,008
WBR	0	0	0	0	0	0	0	0	0	0	0	0
North Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
South Leg												
Approach	675	14	7	2	41	716	323	4	5	3	25	348
Departure	114	7	3	0	17	131	540	2	1	1	9	549
Total	789	21	10	2	58	847	863	6	6	4	34	897
East Leg												
Approach	2,161	26	12	47	205	2,366	1,012	12	5	10	59	1,071
Departure	725	21	8	24	120	845	1,841	28	15	15	117	1,958
Total	2,886	47	20	71	325	3,211	2,853	40	20	25	176	3,029
West Leg												
Approach	717	23	10	22	121	838	2,228	27	14	16	117	2,345
Departure	2,714	35	18	47	230	2,944	1,182	13	8	13	75	1,257
Total	3,431	58	28	69	351	3,782	3,410	40	22	29	192	3,602
Total Approaches												
Approach	3,553	63	29	71	367	3,920	3,563	43	24	29	201	3,764
Departure	3,553	63	29	71	367	3,920	3,563	43	24	29	201	3,764
Total	7,106	126	58	142	734	7,840	7,126	86	48	58	402	7,528



LSA

FIGURE 7

XXXX / YYYY AM / PM Peak Hour Volumes

Irwindale Regional Shopping Center
Traffic Impact Study
Existing Peak Hour Traffic Volumes

R:\COI1401_Irwindale Outlet Center\Traffic\g30-Vol-Exist (8/27/2014)

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APPENDIX D:

FREEWAY TRAFFIC VOLUME DATA

2014

Annual Average Daily Truck Traffic on the California State Highway System

Compiled by
Traffic Data Branch

State of California
California State Transportation Agency
Department of Transportation

Prepared in cooperation with the
U.S. Department of Transportation
Federal Highway Administration

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK By 2	TRUCK By 3	AADT Axle 4	TOTAL By 5+	% TRUCK By 2	% TRUCK By 3	AADT Axle 4	By 5+	EAL 2-WAY (1000)	YEAR VER/ EST
210	07	LA	R18.872	A	LA CANADA-FLINTRIDGE, WEST JCT. RTE. 2	123,000	10,640	8.65	3,077	447	233	6,883	28.92	4.20	2.19	64.69	2,558	12E
210	07	LA	R19.881	A	LA CANADA-FLINTRIDGE, EAST JCT. RTE. 2	120,000	10,380	8.65	3,002	436	227	6,715	28.92	4.20	2.19	64.69	2,495	12E
210	07	LA	R24.962	B	PASADENA, JCT. RTES. 134/710	137,000	9,878	7.21	2,857	415	216	6,390	28.92	4.20	2.19	64.69	2,374	12E
210	07	LA	R24.962	A	PASADENA, JCT. RTES. 134/710	302,000	13,560	4.49	4,155	1,460	648	7,297	30.64	10.77	4.78	53.81	2,892	12E
210	07	LA	R26.326	A	PASADENA, LAKE AVE	301,000	12,793	4.25	4,337	1,607	664	6,185	33.90	12.56	5.19	48.35	2,531	13V
210	07	LA	L29.795	B	PASADENA, ROSEMEAD BLVD	262,000	15,457	5.90	4,917	1,486	864	8,190	31.81	9.61	5.59	52.98	3,261	12E
210	07	LA	R29.486	A	PASADENA, ROSEMEAD BLVD	254,000	16,152	6.36	5,139	1,552	903	8,558	31.81	9.61	5.59	52.98	3,408	12E
210	07	LA	R32.89	A	MONROVIA, HUNTINGTON DRIVE	242,000	14,858	6.14	4,165	2,138	788	7,767	28.03	14.39	5.30	52.27	3,138	00E
210	07	LA	R36.41	B	DUARTE, JCT. RTE. 605	251,000	19,578	7.80	6,529	1,586	1,302	10,161	33.35	8.10	6.65	51.90	4,071	12E
210	07	LA	R36.41	A	DUARTE, JCT. RTE. 605	262,000	18,497	7.06	5,564	1,114	414	11,405	30.08	6.02	2.24	61.66	4,293	12E
210	07	LA	R41.594	A	GLENDORA, GRAND AVE	245,000	19,992	8.16	6,755	1,106	422	11,709	33.79	5.53	2.11	58.57	4,440	13V
210	07	LA	R44.377	B	GLENDORA, JCT RTE 57	245,000	17,052	6.96	5,129	1,027	382	10,514	30.08	6.02	2.24	61.66	3,957	12E
210	07	LA	R44.377	A	GLENDORA, JCT RTE 57	187,000	6,676	3.57	2,112	643	208	3,713	31.64	9.63	3.12	55.61	1,445	12E
210	07	LA	R51.849	B	CLAREMONT, BASELINE RD	163,000	6,862	4.21	2,851	665	249	3,097	41.55	9.69	3.63	45.13	1,266	13V
210	08	SBD	11.498	B	JCT RTE 15	160,000	7,488	4.68	2,082	911	294	4,201	27.80	12.17	3.93	56.10	1,649	05E
210	08	SBD	R31.7	A	E/O SANTA ANA RIVER BRIDGE	160,000	4,263	2.66	1,661	324	126	2,152	38.96	7.60	2.96	50.48	847	14V

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK ----------By Axle----- 2	3	AADT 4	TOTAL 5+	% TRUCK ----------By Axle----- 2	3	AADT 4	5+	EAL 2-WAY (1000)	YEAR VER/ EST
605	07	LA	R13.569	A	WHITTIER, JCT. RTE. 72	247,000	26,454	10.71	#####	2,407	1,151	12,674	38.64	9.10	4.35	47.91	5,121	12E
605	07	LA	R17.407	B	INDUSTRY, JCT. RTE. 60	249,000	26,669	10.71	#####	2,427	1,160	12,777	38.64	9.10	4.35	47.91	5,163	12E
605	07	LA	R17.407	A	INDUSTRY, JCT. RTE. 60	224,000	21,952	9.80	9,075	2,235	957	9,685	41.34	10.18	4.36	44.12	4,005	12E
605	07	LA	R20.189	B	BALDWIN PARK, JCT. RTE. 10	220,000	21,560	9.80	8,913	2,195	940	9,512	41.34	10.18	4.36	44.12	3,934	12E
605	07	LA	20.189	A	BALDWIN PARK, JCT. RTE. 10	183,000	12,609	6.89	5,418	1,727	664	4,800	42.97	13.70	5.27	38.07	2,102	12E
605	07	LA	22.681	O	SAN GABRIEL RIVER BRIDGE	160,000	11,025	6.89	4,737	1,510	581	4,197	42.97	13.70	5.27	38.07	1,838	12E
605	07	LA	25.76	B	IRWINDALE, JCT. RTE. 210	148,000	10,198	6.89	4,382	1,397	537	3,882	42.97	13.70	5.27	38.07	1,700	12E
680	04	SCL	M0	A	SAN JOSE, JCT. RTES. 101/280	148,000	2,812	1.90	1,144	357	110	1,201	40.70	12.70	3.90	42.70	503	94E
680	04	SCL	M0.385	B	SAN JOSE, KING RD	148,000	4,144	2.80	1,807	410	348	1,579	43.60	9.90	8.40	38.10	697	94E
680	04	SCL	M0.385	A	SAN JOSE, KING RD	205,000	9,019	4.40	3,193	1,109	505	4,212	35.40	12.30	5.60	46.70	1,741	94V
680	04	SCL	M1.74	B	SAN JOSE, JCT. RTE. 130	154,000	6,776	4.40	2,507	637	291	3,341	37.00	9.40	4.30	49.30	1,342	94V
680	04	SCL	M1.74	A	SAN JOSE, JCT. RTE. 130	177,000	7,966	4.50	2,844	789	295	4,038	35.70	9.90	3.70	50.70	1,609	94V
680	04	SCL	M5.068	B	SAN JOSE, CAPITOL AVE	142,000	7,667	5.40	2,599	843	483	3,742	33.90	11.00	6.30	48.80	1,531	94V
680	04	SCL	M5.068	A	SAN JOSE, CAPITOL AVE	145,000	7,830	5.40	2,545	932	485	3,868	32.50	11.90	6.20	49.40	1,581	94V
680	04	SCL	M7.647	B	MILPITAS, JCT. RTE. 237 WEST	138,000	6,348	4.60	2,190	463	216	3,479	34.50	7.30	3.40	54.80	1,351	94V
680	04	SCL	M7.647	A	MILPITAS, JCT. RTE. 237 WEST	130,000	5,329	4.10	1,732	314	261	3,022	32.50	5.90	4.90	56.70	1,170	94V

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FREEWAY MAINLINE AND RAMP
PEAK HOUR VOLUMES

Freeway Volumes - AM Peak Hour

I-605 Northbound

	Existing (2016) Raw	Project Total	Cumulative Total	E+P Total	2017 NP Total	2017 WP Total	2035 NP Total	2035 WP Total
S of Live Oak	**4,188**	122	324	4,310	4,596	4,718	4,956	5,078
Off-Ramp (EB)	1,257	122	137	1,379	1,419	1,541	1,527	1,649
Between	2,931	0	187	2,931	3,177	3,177	3,429	3,429
Loop On-Ramp (EB)	297	0	47	297	350	350	375	375
Between	3,228	0	234	3,228	3,527	3,527	3,804	3,804
Slip On-Ramp (WB)	308	150	5	458	319	469	346	496
N of Arrow	3,536	150	239	3,686	3,846	3,996	4,150	4,300

I-605 Southbound

	Existing (2016) Raw	Project Total	Cumulative Total	E+P Total	2017 NP Total	2017 WP Total	2035 NP Total	2035 WP Total
N of Live Oak	**4,721**	157	355	4,878	5,170	5,327	5,576	5,733
Slip Off-Ramp	896	157	133	1,053	1,047	1,204	1,124	1,281
Between	3,825	0	222	3,825	4,123	4,123	4,452	4,452
Slip On-Ramp	1,296	114	51	1,410	1,373	1,487	1,485	1,599
S of Arrow	5,121	114	273	5,235	5,496	5,610	5,937	6,051

I-210 Westbound

	Existing Raw	Project Total	Cumulative Total	E+P Total	2017 NP Total	2017 WP Total	2035 NP Total	2035 WP Total
E of Irwindale Av.	**7,524**	78	120	7,602	7,794	7,872	8,442	8,520
Slip Off-Ramp (WB)	599	5	29	604	665	670	691	696
Between	6,925	73	91	6,998	7,129	7,202	7,751	7,824
Loop On-Ramp (WB)	540	0	20	540	593	593	617	617
Between	7,465	73	111	7,538	7,722	7,795	8,368	8,441
Slip On-Ramp	461	0	0	461	489	489	510	510
W of Irwindale Av.	7,926	73	111	7,999	8,211	8,284	8,878	8,951

I-210 Eastbound

	Existing Raw	Project Total	Cumulative Total	E+P Total	2017 NP Total	2017 WP Total	2035 NP Total	2035 WP Total
W of Irwindale Av.	7,752	73	126	7,825	8,076	8,149	8,701	8,774
Off-Ramp (EB)	1,539	0	29	1,539	1,662	1,662	1,731	1,731
Between	6,213	73	97	6,286	6,414	6,487	6,970	7,043
Slip On-Ramp (WB)	485	4	20	489	535	539	556	560
E of Irwindale Av.	**6,698**	77	117	6,775	6,949	7,026	7,526	7,603

PeMS Data for Week of January 26-28, 2018 (consistent with count data)

Flow Conserved Volumes

Freeway Mainline Truck %: Based on 2011 Annual Average Daily Truck Traffic (Source: Caltrans)

I-605 = 6.89 %; I-210 = 7.06 % >>> HCS+ Input = 7% (rounded value)

Freeway Volumes - PM Peak Hour

I-605 Northbound

	Existing (2016) Raw	Project Total	Cumulative Total	E+P Total	2017 NP Total	2017 WP Total	2035 NP Total	2035 WP Total
S of Live Oak	**4,183**	129	399	4,312	4,666	4,795	5,025	5,154
Off-Ramp (EB)	1,253	129	136	1,382	1,414	1,543	1,522	1,651
Between	2,930	0	263	2,930	3,252	3,252	3,503	3,503
Loop On-Ramp (EB)	107	0	162	107	271	271	280	280
Between	3,037	0	425	3,037	3,523	3,523	3,783	3,783
Slip On-Ramp (WB)	322	141	13	463	341	482	369	510
N of Arrow	3,359	141	438	3,500	3,864	4,005	4,152	4,293

I-605 Southbound

	Existing (2016) Raw	Project Total	Cumulative Total	E+P Total	2017 NP Total	2017 WP Total	2035 NP Total	2035 WP Total
N of Live Oak	**4,530**	142	378	4,672	4,999	5,141	5,388	5,530
Slip Off-Ramp	584	142	139	726	735	877	784	926
Between	3,946	0	239	3,946	4,264	4,264	4,604	4,604
Slip On-Ramp	1,551	120	175	1,671	1,757	1,877	1,891	2,011
S of Arrow	5,497	120	414	5,617	6,021	6,141	6,495	6,615

I-210 Westbound

	Existing Raw	Project Total	Cumulative Total	E+P Total	2017 NP Total	2017 WP Total	2035 NP Total	2035 WP Total
E of Irwindale Av.	**6,982**	67	139	7,049	7,261	7,328	7,861	7,928
Slip Off-Ramp (WB)	523	5	24	528	579	584	602	607
Between	6,459	62	115	6,521	6,682	6,744	7,259	7,321
Loop On-Ramp (WB)	448	0	25	448	500	500	520	520
Between	6,907	62	140	6,969	7,182	7,244	7,779	7,841
Slip On-Ramp	283	0	0	283	300	300	313	313
W of Irwindale Av.	7,190	62	140	7,252	7,482	7,544	8,092	8,154

I-210 Eastbound

	Existing Raw	Project Total	Cumulative Total	E+P Total	2017 NP Total	2017 WP Total	2035 NP Total	2035 WP Total
W of Irwindale Av.	6,445	63	158	6,508	6,728	6,791	7,286	7,349
Off-Ramp (EB)	822	0	24	822	896	896	933	933
Between	5,623	63	134	5,686	5,832	5,895	6,353	6,416
Slip On-Ramp (WB)	899	5	25	904	979	984	1,019	1,024
E of Irwindale Av.	**6,522**	68	159	6,590	6,811	6,879	7,372	7,440

PeMS Data for Week of January 26-28, 2018 (consistent with count data).

Flow Conserved Volumes

Freeway Mainline Truck %: Based on 2011 Annual Average Daily Truck Traffic (Source: Caltrans)

I-605 = 6.89 %; I-210 = 7.06 % >>> HCS+ Input = 7% (rounded value)

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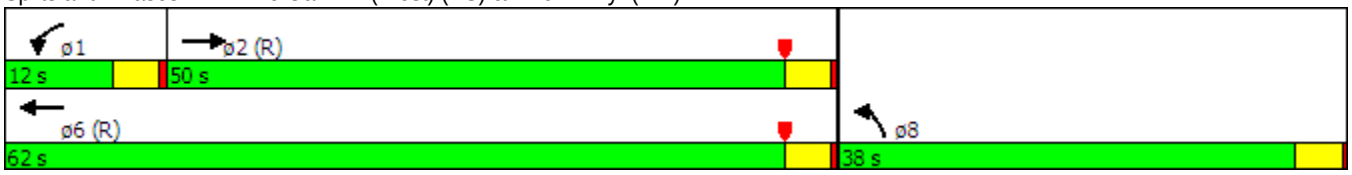
APPENDIX E:

EXISTING (2016) CONDITIONS INTERSECTION ANALYSIS WORKSHEETS

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	547	0	120	1643	912	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	50.0		12.0	62.0	38.0	
Total Split (%)	50.0%		12.0%	62.0%	38.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	547	0	120	1643	912	197
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	595	0	130	1786	991	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1861	0	192	2202	1088	501
Arrive On Green	0.52	0.00	0.11	1.00	0.31	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	595	0	130	1786	991	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	9.6	0.0	3.6	0.0	27.1	0.0
Cycle Q Clear(g_c), s	9.6	0.0	3.6	0.0	27.1	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1861	0	192	2202	1088	501
V/C Ratio(X)	0.32	0.00	0.68	0.81	0.91	0.00
Avail Cap(c_a), veh/h	1861	0	281	2202	1194	549
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.1	0.0	43.7	0.0	33.2	0.0
Incr Delay (d2), s/veh	0.5	0.0	2.3	3.4	9.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	4.8	0.0	1.8	1.0	14.6	0.0
LnGrp Delay(d),s/veh	14.5	0.0	46.0	3.4	43.1	0.0
LnGrp LOS	B		D	A	D	
Approach Vol, veh/h	595			1916	991	
Approach Delay, s/veh	14.5			6.3	43.1	
Approach LOS	B			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.5	55.5				65.0		35.0
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	8.0	46.0				58.0		34.0
Max Q Clear Time (g_c+I1), s	5.6	11.6				2.0		29.1
Green Ext Time (p_c), s	0.0	31.6				49.0		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B

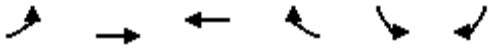
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	288	447	1638	643	120	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	19.0	69.5	50.5	50.5	30.5	30.5
Total Split (%)	19.0%	69.5%	50.5%	50.5%	30.5%	30.5%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	288	447	1638	643	120	122
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	313	486	1780	699	130	133
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	290	2844	2158	965	376	173
Arrive On Green	0.32	1.00	1.00	1.00	0.11	0.11
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	313	486	1780	699	130	133
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	16.0	0.0	0.0	0.0	3.4	8.0
Cycle Q Clear(g_c), s	16.0	0.0	0.0	0.0	3.4	8.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	290	2844	2158	965	376	173
V/C Ratio(X)	1.08	0.17	0.82	0.72	0.35	0.77
Avail Cap(c_a), veh/h	290	2844	2158	965	913	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.64	0.64	1.00	1.00
Uniform Delay (d), s/veh	34.0	0.0	0.0	0.0	41.4	43.4
Incr Delay (d2), s/veh	76.2	0.1	2.4	3.1	0.5	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	14.0	0.1	0.7	0.8	1.7	7.3
LnGrp Delay(d),s/veh	110.2	0.1	2.4	3.1	41.9	50.4
LnGrp LOS	F	A	A	A	D	D
Approach Vol, veh/h		799	2479		263	
Approach Delay, s/veh		43.2	2.6		46.2	
Approach LOS		D	A		D	

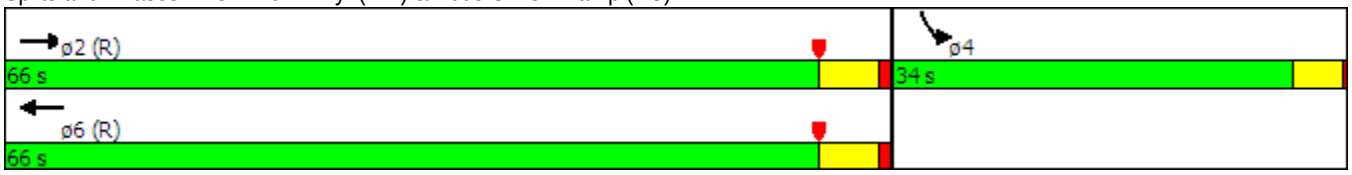
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		84.8		15.2	19.0	65.8		
Change Period (Y+Rc), s		6.0		4.5	3.0	6.0		
Max Green Setting (Gmax), s		63.5		26.0	16.0	44.5		
Max Q Clear Time (g_c+I1), s		2.0		10.0	18.0	2.0		
Green Ext Time (p_c), s		57.4		0.7	0.0	40.5		

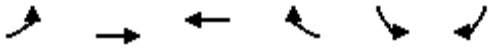
Intersection Summary	
HCM 2010 Ctrl Delay	15.0
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	567	1766	0	381	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		66.0	66.0		34.0	
Total Split (%)		66.0%	66.0%		34.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

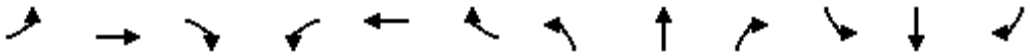




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	567	1766	0	381	515
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	603	1879	0	405	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	3419	2379	0	443	396
Arrive On Green	0.00	1.00	0.66	0.00	0.24	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	603	1879	0	405	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	37.0	0.0	21.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	37.0	0.0	21.8	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	3419	2379	0	443	396
V/C Ratio(X)	0.00	0.18	0.79	0.00	0.91	0.00
Avail Cap(c_a), veh/h	0	3419	2379	0	541	483
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	12.1	0.0	36.7	0.0
Incr Delay (d2), s/veh	0.0	0.1	2.8	0.0	17.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.0	19.2	0.0	13.1	0.0
LnGrp Delay(d),s/veh	0.0	0.1	14.9	0.0	54.6	0.0
LnGrp LOS		A	B		D	
Approach Vol, veh/h		603	1879		405	
Approach Delay, s/veh		0.1	14.9		54.6	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		71.4		28.6		71.4		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		60.5		29.9		60.5		
Max Q Clear Time (g_c+I1), s		2.0		23.8		39.0		
Green Ext Time (p_c), s		57.9		0.7		21.4		

Intersection Summary	
HCM 2010 Ctrl Delay	17.4
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	622	29	0	1766	308	0	0	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	622	29	0	1766	308	0	0	30	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	648	30	0	1840	321	0	0	31	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1840	0	0	648	0	0	1568	2488	324
Stage 1	-	-	-	-	-	-	648	648	-
Stage 2	-	-	-	-	-	-	920	1840	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	335	-	-	947	-	0	104	30	678
Stage 1	-	-	-	-	-	0	488	469	-
Stage 2	-	-	-	-	-	0	353	127	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	335	-	-	947	-	-	104	0	678
Mov Cap-2 Maneuver	-	-	-	-	-	-	104	0	-
Stage 1	-	-	-	-	-	-	488	0	-
Stage 2	-	-	-	-	-	-	353	0	-

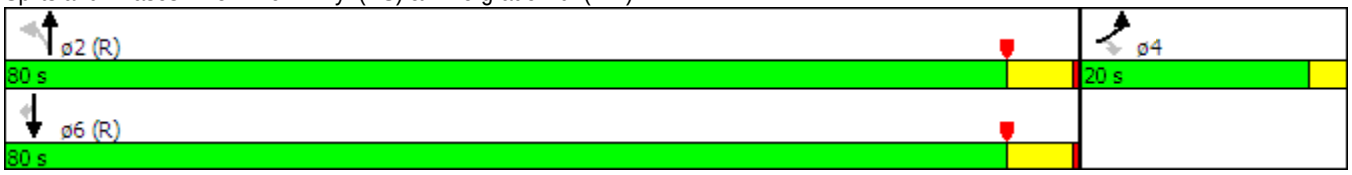
Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	678	335	-	-	947	-
HCM Lane V/C Ratio	0.046	-	-	-	-	-
HCM Control Delay (s)	10.6	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	230	12	21	1885	410	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			931	1292	
Travel Time (s)	15.2			14.1	19.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	20.0	20.0	80.0	80.0	80.0	80.0
Total Split (%)	20.0%	20.0%	80.0%	80.0%	80.0%	80.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	230	12	21	1885	410	298
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	250	13	23	2049	446	324
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	332	153	637	2961	2961	1325
Arrive On Green	0.09	0.09	0.82	0.82	0.82	0.82
Sat Flow, veh/h	3510	1615	710	3705	3705	1615
Grp Volume(v), veh/h	250	13	23	2049	446	324
Grp Sat Flow(s),veh/h/ln	1755	1615	710	1805	1805	1615
Q Serve(g_s), s	6.9	0.7	0.7	23.6	2.5	4.5
Cycle Q Clear(g_c), s	6.9	0.7	3.2	23.6	2.5	4.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	332	153	637	2961	2961	1325
V/C Ratio(X)	0.75	0.09	0.04	0.69	0.15	0.24
Avail Cap(c_a), veh/h	597	275	637	2961	2961	1325
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	41.3	2.2	3.7	1.8	2.0
Incr Delay (d2), s/veh	3.4	0.2	0.1	1.4	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.5	0.3	0.2	11.9	1.3	2.1
LnGrp Delay(d),s/veh	47.5	41.5	2.3	5.1	1.9	2.5
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	263			2072	770	
Approach Delay, s/veh	47.2			5.1	2.2	
Approach LOS	D			A	A	

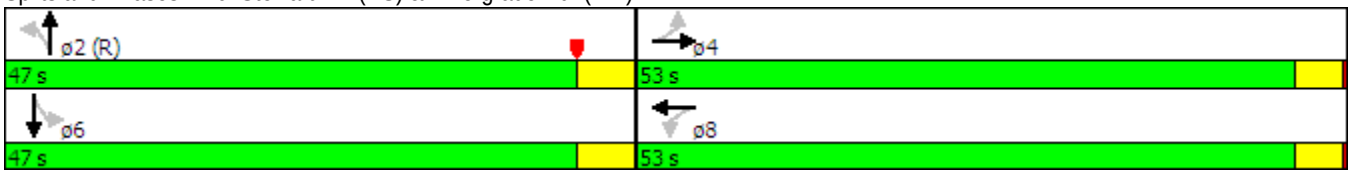
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		87.5		12.5		87.5		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		74.5		17.0		74.5		
Max Q Clear Time (g_c+I1), s		25.6		8.9		6.5		
Green Ext Time (p_c), s		29.5		0.5		34.9		

Intersection Summary	
HCM 2010 Ctrl Delay	7.9
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	114	10	92	261	11	10	9	85	7	6	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	53.0	53.0		53.0	53.0		47.0	47.0		47.0	47.0	
Total Split (%)	53.0%	53.0%		53.0%	53.0%		47.0%	47.0%		47.0%	47.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	114	10	92	261	11	10	9	85	7	6	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	26	128	11	103	293	12	11	10	96	8	7	16
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	164	540	46	233	567	23	1138	117	1120	328	296	618
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1091	3368	286	1270	3535	144	1410	155	1484	375	392	819
Grp Volume(v), veh/h	26	68	71	103	149	156	11	0	106	31	0	0
Grp Sat Flow(s),veh/h/ln	1091	1805	1849	1270	1805	1875	1410	0	1638	1586	0	0
Q Serve(g_s), s	2.2	3.3	3.4	7.7	7.6	7.6	0.0	0.0	1.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.9	3.3	3.4	11.1	7.6	7.6	0.2	0.0	1.7	0.4	0.0	0.0
Prop In Lane	1.00		0.15	1.00		0.08	1.00		0.91	0.26		0.52
Lane Grp Cap(c), veh/h	164	289	296	233	289	300	1138	0	1236	1242	0	0
V/C Ratio(X)	0.16	0.23	0.24	0.44	0.52	0.52	0.01	0.00	0.09	0.02	0.00	0.00
Avail Cap(c_a), veh/h	524	884	906	652	884	919	1138	0	1236	1242	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.98	0.98	0.98	0.63	0.00	0.63	1.00	0.00	0.00
Uniform Delay (d), s/veh	43.0	36.6	36.7	41.5	38.4	38.5	3.0	0.0	3.2	3.1	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.4	0.4	1.3	1.4	1.4	0.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	1.7	1.7	2.8	3.9	4.1	0.1	0.0	0.8	0.2	0.0	0.0
LnGrp Delay(d),s/veh	43.4	37.0	37.0	42.8	39.8	39.8	3.0	0.0	3.3	3.1	0.0	0.0
LnGrp LOS	D	D	D	D	D	D	A		A	A		
Approach Vol, veh/h		165			408			117			31	
Approach Delay, s/veh		38.0			40.6			3.3			3.1	
Approach LOS		D			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		80.0		20.0		80.0		20.0
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		42.5		49.0		42.5		49.0
Max Q Clear Time (g_c+I1), s		3.7		11.9		2.4		13.1
Green Ext Time (p_c), s		0.5		3.0		0.5		3.0

Intersection Summary	
HCM 2010 Ctrl Delay	32.3
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	311	611	685	1353	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	28.0		72.0	100.0		
Total Split (%)	28.0%		72.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



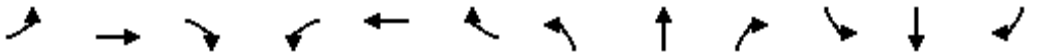
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	311	611	685	1353	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	331	0	729	1439		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.94	0.94	0.94	0.94		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	931	417	1202	3531		
Arrive On Green	0.26	0.00	1.00	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	331	0	729	1439		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	7.5	0.0	0.0	0.0		
Cycle Q Clear(g_c), s	7.5	0.0	0.0	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	931	417	1202	3531		
V/C Ratio(X)	0.36	0.00	0.61	0.41		
Avail Cap(c_a), veh/h	931	417	1202	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	30.3	0.0	0.0	0.0		
Incr Delay (d2), s/veh	1.1	0.0	2.3	0.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	3.9	0.0	0.8	0.2		
LnGrp Delay(d),s/veh	31.4	0.0	2.3	0.4		
LnGrp LOS	C		A	A		
Approach Vol, veh/h	331			2168		
Approach Delay, s/veh	31.4			1.0		
Approach LOS	C			A		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	72.0	31.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	66.4	* 23				94.4		
Max Q Clear Time (g_c+I1), s	2.0	9.5				2.0		
Green Ext Time (p_c), s	7.9	11.3				48.3		

Intersection Summary	
HCM 2010 Ctrl Delay	5.0
HCM 2010 LOS	A

Notes

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	311	0	0	1442	0	0	0	661	0	0	596
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	74.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	311	0	0	1442	0	0	0	661	0	0	596
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	321	0	0	1487	0	0	0	681	0	0	614

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1487	0	0	321	0	0	1064	1808	160	1647	1808	743
Stage 1	-	-	-	-	-	-	321	321	-	1487	1487	-
Stage 2	-	-	-	-	-	-	743	1487	-	160	321	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	458	-	-	1250	-	-	180	80	863	67	80	~ 362
Stage 1	-	-	-	-	-	-	671	655	-	133	190	-
Stage 2	-	-	-	-	-	-	378	190	-	832	655	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	458	-	-	1250	-	-	-	80	863	14	80	~ 362
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	80	-	14	80	-
Stage 1	-	-	-	-	-	-	671	655	-	133	190	-
Stage 2	-	-	-	-	-	-	-	190	-	175	655	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	22.9	$ 351.3
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	863	458	-	-	1250	-	-	362
HCM Lane V/C Ratio	0.79	-	-	-	-	-	-	1.697
HCM Control Delay (s)	22.9	0	-	-	0	-	-	$ 351.3
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	8.3	0	-	-	0	-	-	37.7

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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	869	103	46	1294	148	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	57.0	57.0	12.0	69.0	31.0	
Total Split (%)	57.0%	57.0%	12.0%	69.0%	31.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 12 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



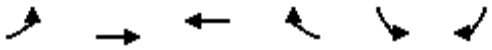
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	869	103	46	1294	148	56
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	945	112	50	1407	161	61
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2564	1147	64	2801	189	71
Arrive On Green	0.23	0.23	0.04	0.78	0.15	0.15
Sat Flow, veh/h	3705	1615	1810	3705	1265	479
Grp Volume(v), veh/h	945	112	50	1407	223	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1752	0
Q Serve(g_s), s	21.9	5.4	2.7	14.3	12.4	0.0
Cycle Q Clear(g_c), s	21.9	5.4	2.7	14.3	12.4	0.0
Prop In Lane		1.00	1.00		0.72	0.27
Lane Grp Cap(c), veh/h	2564	1147	64	2801	261	0
V/C Ratio(X)	0.37	0.10	0.78	0.50	0.85	0.00
Avail Cap(c_a), veh/h	2564	1147	163	2801	491	0
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.5	13.2	47.8	4.1	41.5	0.0
Incr Delay (d2), s/veh	0.4	0.2	7.2	0.6	7.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	11.1	2.5	1.5	7.3	6.6	0.0
LnGrp Delay(d),s/veh	19.9	13.3	55.1	4.8	49.2	0.0
LnGrp LOS	B	B	E	A	D	
Approach Vol, veh/h	1057			1457	223	
Approach Delay, s/veh	19.2			6.5	49.2	
Approach LOS	B			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.6	75.5				82.1		17.9
Change Period (Y+Rc), s	3.0	4.5				4.5		3.0
Max Green Setting (Gmax), s	9.0	52.5				64.5		28.0
Max Q Clear Time (g_c+I1), s	4.7	23.9				16.3		14.4
Green Ext Time (p_c), s	0.0	24.4				37.7		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.9
HCM 2010 LOS	B

Notes

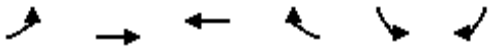
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	83	846	1230	53	13	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	83	846	1230	53	13	128
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	87	891	1295	56	14	135
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.80				0.87	0.80
vC, conflicting volume	1351				1915	647
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	942				1061	65
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				92	83
cM capacity (veh/h)	590				164	795

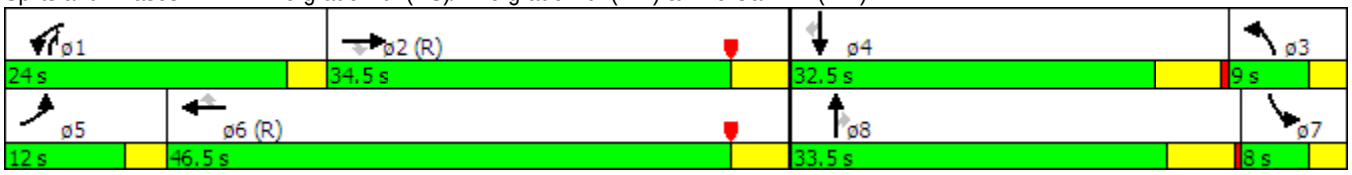
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	87	445	445	647	647	56	148
Volume Left	87	0	0	0	0	0	14
Volume Right	0	0	0	0	0	56	135
cSH	590	1700	1700	1700	1700	1700	587
Volume to Capacity	0.15	0.26	0.26	0.38	0.38	0.03	0.25
Queue Length 95th (ft)	13	0	0	0	0	0	25
Control Delay (s)	12.2	0.0	0.0	0.0	0.0	0.0	13.2
Lane LOS	B						B
Approach Delay (s)	1.1			0.0			13.2
Approach LOS							B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	678	84	251	1158	13	40	49	104	29	74	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	12.0	34.5	34.5	24.0	46.5	46.5	9.0	33.5	24.0	8.0	32.5	32.5
Total Split (%)	12.0%	34.5%	34.5%	24.0%	46.5%	46.5%	9.0%	33.5%	24.0%	8.0%	32.5%	32.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	89	678	84	251	1158	13	40	49	104	29	74	70
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	97	737	0	273	1259	14	43	53	113	32	80	76
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	124	2078	929	299	2426	1085	57	144	389	43	245	110
Arrive On Green	0.02	0.19	0.00	0.33	1.00	1.00	0.03	0.08	0.08	0.02	0.07	0.07
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	97	737	0	273	1259	14	43	53	113	32	80	76
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	5.3	17.7	0.0	14.5	0.0	0.0	2.4	2.7	4.7	1.8	2.1	3.8
Cycle Q Clear(g_c), s	5.3	17.7	0.0	14.5	0.0	0.0	2.4	2.7	4.7	1.8	2.1	3.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	124	2078	929	299	2426	1085	57	144	389	43	245	110
V/C Ratio(X)	0.78	0.35	0.00	0.91	0.52	0.01	0.75	0.37	0.29	0.75	0.33	0.69
Avail Cap(c_a), veh/h	163	2078	929	380	2426	1085	109	532	719	90	975	436
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.55	0.55	0.55	1.00	1.00	1.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	48.1	24.4	0.0	32.8	0.0	0.0	48.0	43.9	20.9	48.5	44.4	31.8
Incr Delay (d2), s/veh	11.9	0.5	0.0	12.7	0.4	0.0	7.2	2.7	0.7	7.7	1.1	10.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.1	9.0	0.0	8.2	0.1	0.0	1.3	1.5	2.1	1.0	1.1	2.0
LnGrp Delay(d),s/veh	60.0	24.9	0.0	45.5	0.4	0.0	55.2	46.6	21.6	56.3	45.5	42.2
LnGrp LOS	E	C		D	A	A	E	D	C	E	D	D
Approach Vol, veh/h		834			1546			209			188	
Approach Delay, s/veh		28.9			8.4			34.8			46.0	
Approach LOS		C			A			C			D	

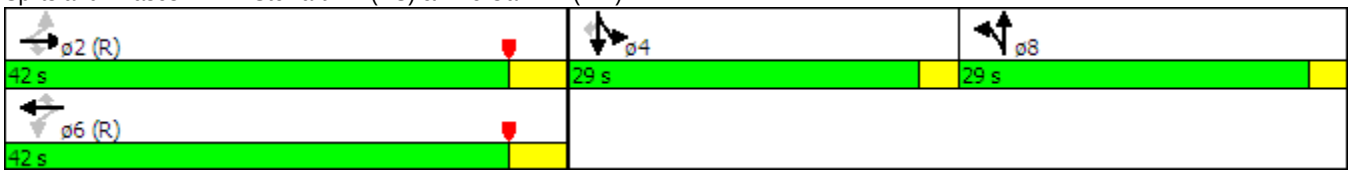
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.5	62.0	6.2	12.3	9.9	71.7	5.4	13.1
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	21.0	30.0	6.0	27.0	9.0	42.0	5.0	28.0
Max Q Clear Time (g_c+I1), s	16.5	19.7	4.4	5.8	7.3	2.0	3.8	6.7
Green Ext Time (p_c), s	0.0	8.9	0.0	1.0	0.0	26.9	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	623	26	17	1503	35	210	118	32	13	26	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	623	26	17	1503	35	210	118	32	13	26	76
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	21	677	28	18	1634	38	228	128	35	14	28	83
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	249	2121	949	515	2121	949	250	140	38	129	136	115
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.24	0.24	0.24	0.07	0.07	0.07
Sat Flow, veh/h	301	3610	1615	754	3610	1615	1060	595	163	1810	1900	1615
Grp Volume(v), veh/h	21	677	28	18	1634	38	391	0	0	14	28	83
Grp Sat Flow(s),veh/h/ln	301	1805	1615	754	1805	1615	1818	0	0	1810	1900	1615
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	20.9	0.0	0.0	0.7	1.4	5.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	20.9	0.0	0.0	0.7	1.4	5.0
Prop In Lane	1.00		1.00	1.00		1.00	0.58		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	249	2121	949	515	2121	949	429	0	0	129	136	115
V/C Ratio(X)	0.08	0.32	0.03	0.03	0.77	0.04	0.91	0.00	0.00	0.11	0.21	0.72
Avail Cap(c_a), veh/h	249	2121	949	515	2121	949	473	0	0	470	494	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.78	0.78	0.78	1.00	0.00	0.00	0.90	0.90	0.90
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	37.2	0.0	0.0	43.4	43.8	45.4
Incr Delay (d2), s/veh	0.6	0.4	0.1	0.1	2.2	0.1	20.7	0.0	0.0	0.3	0.7	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.1	0.0	0.0	0.6	0.0	13.0	0.0	0.0	0.4	0.8	2.5
LnGrp Delay(d),s/veh	0.6	0.4	0.1	0.1	2.2	0.1	57.9	0.0	0.0	43.8	44.4	52.8
LnGrp LOS	A	A	A	A	A	A	E			D	D	D
Approach Vol, veh/h		726			1690			391			125	
Approach Delay, s/veh		0.4			2.1			57.9			49.9	
Approach LOS		A			A			E			D	

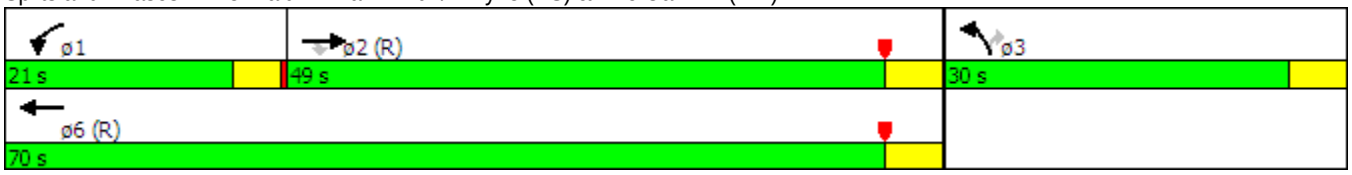
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		63.3		10.1		63.3		26.6
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		2.0		7.0		2.0		22.9
Green Ext Time (p_c), s		16.1		0.3		16.1		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	11.2
HCM 2010 LOS	B

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	525	63	131	1376	296	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	200		100	0
Storage Lanes		1	1		1	1
Taper Length (ft)			60		60	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	1141			511	1039	
Travel Time (s)	17.3			7.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	10.0	10.0
Minimum Split (s)	20.5	20.5	8.0	20.0	20.5	20.5
Total Split (s)	49.0	49.0	21.0	70.0	30.0	30.0
Total Split (%)	49.0%	49.0%	21.0%	70.0%	30.0%	30.0%
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5	4.5
All-Red Time (s)	0.0	0.0	0.5	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.0	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	525	63	131	1376	296	290
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	571	68	142	1496	322	315
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1876	839	172	2365	895	412
Arrive On Green	1.00	1.00	0.19	1.00	0.25	0.25
Sat Flow, veh/h	3705	1615	1810	3705	3510	1615
Grp Volume(v), veh/h	571	68	142	1496	322	315
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1755	1615
Q Serve(g_s), s	0.0	0.0	7.5	0.0	7.5	18.1
Cycle Q Clear(g_c), s	0.0	0.0	7.5	0.0	7.5	18.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1876	839	172	2365	895	412
V/C Ratio(X)	0.30	0.08	0.82	0.63	0.36	0.76
Avail Cap(c_a), veh/h	1876	839	308	2365	895	412
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.84	0.84	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	39.7	0.0	30.6	34.5
Incr Delay (d2), s/veh	0.4	0.2	8.0	1.1	1.1	12.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.1	0.0	4.1	0.4	3.8	9.5
LnGrp Delay(d),s/veh	0.4	0.2	47.7	1.1	31.7	47.2
LnGrp LOS	A	A	D	A	C	D
Approach Vol, veh/h	639			1638	637	
Approach Delay, s/veh	0.4			5.1	39.3	
Approach LOS	A			A	D	

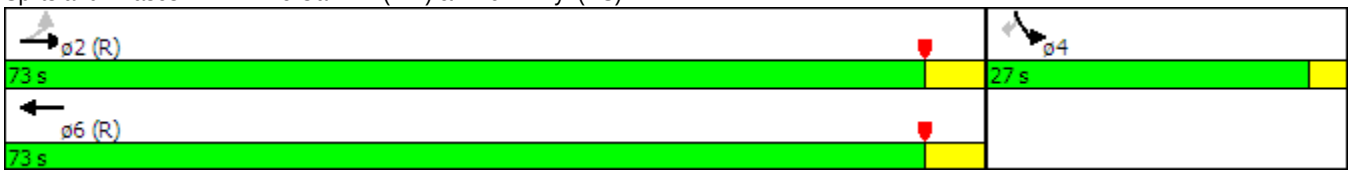
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.5	56.5				70.0		30.0
Change Period (Y+Rc), s	4.0	4.5				4.5		4.5
Max Green Setting (Gmax), s	17.0	44.5				65.5		25.5
Max Q Clear Time (g_c+I1), s	9.5	2.0				2.0		20.1
Green Ext Time (p_c), s	0.2	33.0				44.5		2.0

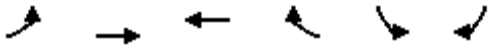
Intersection Summary	
HCM 2010 Ctrl Delay	11.6
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	99	716	1442	0	357	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	20.0	20.0	28.5		27.0	27.0
Total Split (s)	73.0	73.0	73.0		27.0	27.0
Total Split (%)	73.0%	73.0%	73.0%		27.0%	27.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 33 (33%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	99	716	1442	0	357	65
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	102	738	1487	0	368	67
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	304	2858	2858	0	468	215
Arrive On Green	0.53	0.53	0.79	0.00	0.13	0.13
Sat Flow, veh/h	360	3705	3800	0	3510	1615
Grp Volume(v), veh/h	102	738	1487	0	368	67
Grp Sat Flow(s),veh/h/ln	360	1805	1805	0	1755	1615
Q Serve(g_s), s	19.8	11.1	14.6	0.0	10.1	3.8
Cycle Q Clear(g_c), s	34.4	11.1	14.6	0.0	10.1	3.8
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	304	2858	2858	0	468	215
V/C Ratio(X)	0.34	0.26	0.52	0.00	0.79	0.31
Avail Cap(c_a), veh/h	304	2858	2858	0	843	388
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	7.5	3.7	0.0	42.0	39.2
Incr Delay (d2), s/veh	2.7	0.2	0.7	0.0	3.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	2.2	5.6	7.3	0.0	5.1	1.7
LnGrp Delay(d),s/veh	20.8	7.7	4.4	0.0	44.9	40.0
LnGrp LOS	C	A	A		D	D
Approach Vol, veh/h		840	1487		435	
Approach Delay, s/veh		9.3	4.4		44.2	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		83.7		16.3		83.7		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		68.5		24.0		68.5		
Max Q Clear Time (g_c+I1), s		36.4		12.1		16.6		
Green Ext Time (p_c), s		28.3		1.2		43.0		

Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	781	107	34	2637	612	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	71.0	71.0	71.0	71.0	29.0	29.0
Total Split (%)	71.0%	71.0%	71.0%	71.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	781	107	34	2637	612	104
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	849	116	37	2866	665	113
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2383	1066	401	3423	878	404
Arrive On Green	0.66	0.66	0.66	0.66	0.25	0.25
Sat Flow, veh/h	3705	1615	591	5358	3510	1615
Grp Volume(v), veh/h	849	116	37	2866	665	113
Grp Sat Flow(s),veh/h/ln	1805	1615	591	1729	1755	1615
Q Serve(g_s), s	10.5	2.6	3.0	42.0	17.5	5.6
Cycle Q Clear(g_c), s	10.5	2.6	13.4	42.0	17.5	5.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2383	1066	401	3423	878	404
V/C Ratio(X)	0.36	0.11	0.09	0.84	0.76	0.28
Avail Cap(c_a), veh/h	2383	1066	401	3423	878	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.6	6.2	10.5	12.9	34.7	30.2
Incr Delay (d2), s/veh	0.4	0.2	0.5	2.6	6.1	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	5.3	1.2	0.5	20.5	9.2	2.7
LnGrp Delay(d),s/veh	8.0	6.4	11.0	15.5	40.8	32.0
LnGrp LOS	A	A	B	B	D	C
Approach Vol, veh/h	965			2903	778	
Approach Delay, s/veh	7.8			15.5	39.5	
Approach LOS	A			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		71.0				71.0		29.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		66.0				66.0		25.0
Max Q Clear Time (g_c+I1), s		12.5				44.0		19.5
Green Ext Time (p_c), s		52.9				21.9		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	17.9
HCM 2010 LOS	B

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	865	0	237	893	821	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	44.0		16.0	60.0	40.0	
Total Split (%)	44.0%		16.0%	60.0%	40.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	865	0	237	893	821	117
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	940	0	258	971	892	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1805	0	322	2281	1011	465
Arrive On Green	0.50	0.00	0.18	1.00	0.29	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	940	0	258	971	892	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	17.6	0.0	7.0	0.0	24.3	0.0
Cycle Q Clear(g_c), s	17.6	0.0	7.0	0.0	24.3	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1805	0	322	2281	1011	465
V/C Ratio(X)	0.52	0.00	0.80	0.43	0.88	0.00
Avail Cap(c_a), veh/h	1805	0	421	2281	1264	581
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.9	0.0	39.9	0.0	34.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	6.6	0.6	6.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	9.0	0.0	3.7	0.2	12.7	0.0
LnGrp Delay(d),s/veh	18.0	0.0	46.5	0.6	40.4	0.0
LnGrp LOS	B		D	A	D	
Approach Vol, veh/h	940			1229	892	
Approach Delay, s/veh	18.0			10.2	40.4	
Approach LOS	B			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.2	54.0				67.2		32.8
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	12.0	40.0				56.0		36.0
Max Q Clear Time (g_c+I1), s	9.0	19.6				2.0		26.3
Green Ext Time (p_c), s	0.2	17.5				38.4		2.6

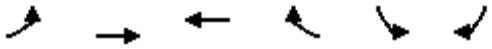
Intersection Summary	
HCM 2010 Ctrl Delay	21.4
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	188	792	825	198	361	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	24.0	68.0	44.0	44.0	32.0	32.0
Total Split (%)	24.0%	68.0%	44.0%	44.0%	32.0%	32.0%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	188	792	825	198	361	310
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	204	861	897	215	392	337
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	233	2382	1809	809	826	380
Arrive On Green	0.26	1.00	1.00	1.00	0.24	0.24
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	204	861	897	215	392	337
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	10.8	0.0	0.0	0.0	9.6	20.2
Cycle Q Clear(g_c), s	10.8	0.0	0.0	0.0	9.6	20.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	233	2382	1809	809	826	380
V/C Ratio(X)	0.88	0.36	0.50	0.27	0.47	0.89
Avail Cap(c_a), veh/h	380	2382	1809	809	965	444
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.97	0.97	1.00	1.00
Uniform Delay (d), s/veh	36.4	0.0	0.0	0.0	32.9	37.0
Incr Delay (d2), s/veh	7.2	0.4	0.9	0.8	0.4	17.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	5.8	0.1	0.2	0.2	4.7	18.3
LnGrp Delay(d),s/veh	43.5	0.4	0.9	0.8	33.3	54.2
LnGrp LOS	D	A	A	A	C	D
Approach Vol, veh/h		1065	1112		729	
Approach Delay, s/veh		8.7	0.9		43.0	
Approach LOS		A	A		D	

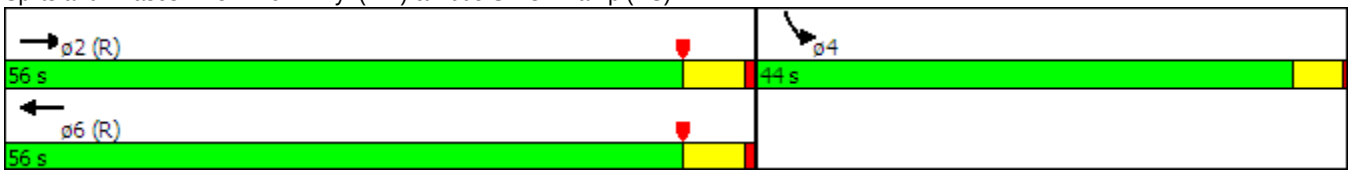
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		72.0		28.0	15.9	56.1		
Change Period (Y+Rc), s		6.0		4.5	3.0	6.0		
Max Green Setting (Gmax), s		62.0		27.5	21.0	38.0		
Max Q Clear Time (g_c+I1), s		2.0		22.2	12.8	2.0		
Green Ext Time (p_c), s		40.9		1.4	0.1	28.1		

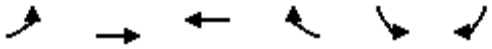
Intersection Summary	
HCM 2010 Ctrl Delay	14.3
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1153	717	0	278	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		56.0	56.0		44.0	
Total Split (%)		56.0%	56.0%		44.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

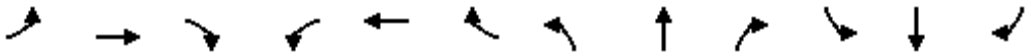




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	1153	717	0	278	306
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	1253	779	0	302	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	3700	2575	0	345	308
Arrive On Green	0.00	1.00	0.71	0.00	0.19	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	1253	779	0	302	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	7.9	0.0	16.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	7.9	0.0	16.2	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	3700	2575	0	345	308
V/C Ratio(X)	0.00	0.34	0.30	0.00	0.87	0.00
Avail Cap(c_a), veh/h	0	3700	2575	0	722	644
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.90	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	5.2	0.0	39.3	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.3	0.0	7.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.1	4.0	0.0	8.8	0.0
LnGrp Delay(d),s/veh	0.0	0.2	5.5	0.0	46.3	0.0
LnGrp LOS		A	A		D	
Approach Vol, veh/h		1253	779		302	
Approach Delay, s/veh		0.2	5.5		46.3	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		76.8		23.2		76.8		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		50.5		39.9		50.5		
Max Q Clear Time (g_c+I1), s		2.0		18.2		9.9		
Green Ext Time (p_c), s		46.3		0.9		39.0		

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1309	15	0	717	322	0	0	32	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1309	15	0	717	322	0	0	32	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1393	16	0	763	343	0	0	34	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	763	0	0	1393	0	0	1774	2156	696
Stage 1	-	-	-	-	-	-	1393	1393	-
Stage 2	-	-	-	-	-	-	381	763	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	859	-	-	497	-	0	76	48	389
Stage 1	-	-	-	-	-	0	199	211	-
Stage 2	-	-	-	-	-	0	666	416	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	859	-	-	497	-	-	76	0	389
Mov Cap-2 Maneuver	-	-	-	-	-	-	76	0	-
Stage 1	-	-	-	-	-	-	199	0	-
Stage 2	-	-	-	-	-	-	666	0	-

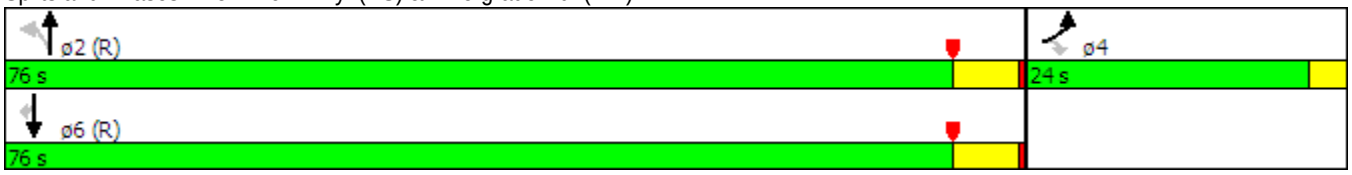
Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	389	859	-	-	497	-
HCM Lane V/C Ratio	0.088	-	-	-	-	-
HCM Control Delay (s)	15.1	0	-	-	0	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	154	17	19	862	1090	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			931	1292	
Travel Time (s)	15.2			14.1	19.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	24.0	24.0	76.0	76.0	76.0	76.0
Total Split (%)	24.0%	24.0%	76.0%	76.0%	76.0%	76.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 5 (5%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	154	17	19	862	1090	141
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	160	18	20	898	1135	147
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	240	111	412	3056	3056	1367
Arrive On Green	0.07	0.07	0.85	0.85	0.85	0.85
Sat Flow, veh/h	3510	1615	438	3705	3705	1615
Grp Volume(v), veh/h	160	18	20	898	1135	147
Grp Sat Flow(s),veh/h/ln	1755	1615	438	1805	1805	1615
Q Serve(g_s), s	4.4	1.0	1.1	5.1	7.0	1.5
Cycle Q Clear(g_c), s	4.4	1.0	8.1	5.1	7.0	1.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	240	111	412	3056	3056	1367
V/C Ratio(X)	0.67	0.16	0.05	0.29	0.37	0.11
Avail Cap(c_a), veh/h	737	339	412	3056	3056	1367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.5	43.9	2.6	1.6	1.7	1.3
Incr Delay (d2), s/veh	3.1	0.7	0.2	0.2	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	2.3	0.5	0.2	2.6	3.6	0.7
LnGrp Delay(d),s/veh	48.6	44.6	2.8	1.8	2.1	1.5
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	178			918	1282	
Approach Delay, s/veh	48.2			1.8	2.0	
Approach LOS	D			A	A	

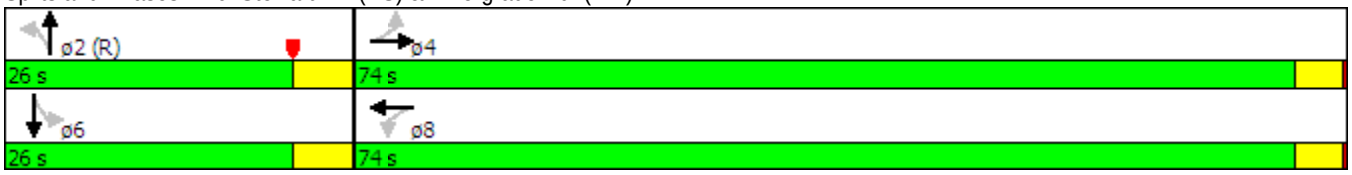
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		90.2		9.8		90.2		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		70.5		21.0		70.5		
Max Q Clear Time (g_c+I1), s		10.1		6.4		9.0		
Green Ext Time (p_c), s		27.9		0.4		28.1		

Intersection Summary	
HCM 2010 Ctrl Delay	5.4
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	132	38	296	67	3	1	2	65	4	21	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	74.0	74.0		74.0	74.0		26.0	26.0		26.0	26.0	
Total Split (%)	74.0%	74.0%		74.0%	74.0%		26.0%	26.0%		26.0%	26.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 86 (86%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	132	38	296	67	3	1	2	65	4	21	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	3	171	49	384	87	4	1	3	84	5	27	19
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	585	1122	313	499	1414	65	787	29	804	97	502	332
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.51	0.51	0.51	0.51	0.51	0.51
Sat Flow, veh/h	1326	2791	777	1179	3516	161	1381	56	1567	112	978	647
Grp Volume(v), veh/h	3	109	111	384	44	47	1	0	87	51	0	0
Grp Sat Flow(s),veh/h/ln	1326	1805	1763	1179	1805	1872	1381	0	1623	1738	0	0
Q Serve(g_s), s	0.1	3.8	4.0	30.8	1.5	1.5	0.0	0.0	2.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.7	3.8	4.0	34.8	1.5	1.5	0.0	0.0	2.8	1.4	0.0	0.0
Prop In Lane	1.00		0.44	1.00		0.09	1.00		0.97	0.10		0.37
Lane Grp Cap(c), veh/h	585	726	709	499	726	753	787	0	833	931	0	0
V/C Ratio(X)	0.01	0.15	0.16	0.77	0.06	0.06	0.00	0.00	0.10	0.05	0.00	0.00
Avail Cap(c_a), veh/h	980	1264	1234	850	1264	1310	787	0	833	931	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	0.92	0.00	0.92	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.8	19.0	19.1	30.2	18.3	18.3	11.9	0.0	12.5	12.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	2.5	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.1	1.9	2.0	10.4	0.8	0.8	0.0	0.0	1.3	0.7	0.0	0.0
LnGrp Delay(d),s/veh	18.8	19.1	19.2	32.7	18.4	18.4	11.9	0.0	12.8	12.3	0.0	0.0
LnGrp LOS	B	B	B	C	B	B	B		B	B		
Approach Vol, veh/h		223			475			88			51	
Approach Delay, s/veh		19.1			30.0			12.8			12.3	
Approach LOS		B			C			B			B	

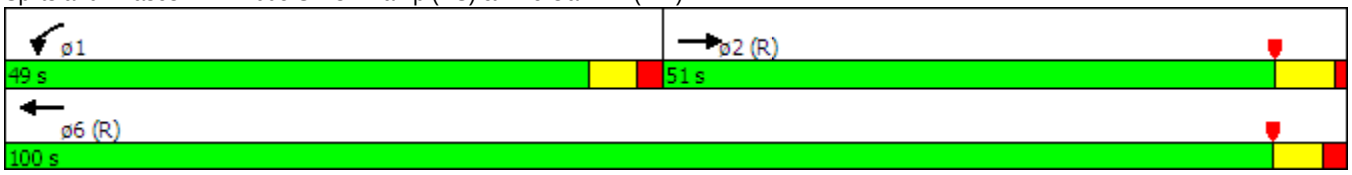
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		55.8		44.2		55.8		44.2
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		21.5		70.0		21.5		70.0
Max Q Clear Time (g_c+I1), s		4.8		6.0		3.4		36.8
Green Ext Time (p_c), s		0.4		3.5		0.4		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	24.2
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1267	978	573	1335	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	51.0		49.0	100.0		
Total Split (%)	51.0%		49.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



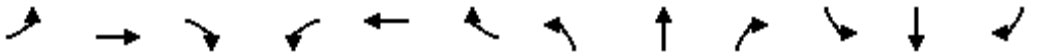
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1267	978	573	1335	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	1362	0	616	1435		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	1762	788	785	3531		
Arrive On Green	0.49	0.00	0.87	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	1362	0	616	1435		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	31.0	0.0	14.1	0.0		
Cycle Q Clear(g_c), s	31.0	0.0	14.1	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	1762	788	785	3531		
V/C Ratio(X)	0.77	0.00	0.78	0.41		
Avail Cap(c_a), veh/h	1762	788	785	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	21.0	0.0	4.7	0.0		
Incr Delay (d2), s/veh	3.4	0.0	7.7	0.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	16.1	0.0	7.8	0.2		
LnGrp Delay(d),s/veh	24.4	0.0	12.4	0.3		
LnGrp LOS	C		B	A		
Approach Vol, veh/h	1362			2051		
Approach Delay, s/veh	24.4			4.0		
Approach LOS	C			A		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	49.0	54.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	43.4	* 46				94.4		
Max Q Clear Time (g_c+I1), s	16.1	33.0				2.0		
Green Ext Time (p_c), s	5.4	12.1				77.9		

Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Notes

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	1267	0	0	1227	0	0	0	572	0	0	681
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	93.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1267	0	0	1227	0	0	0	572	0	0	681
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1306	0	0	1265	0	0	0	590	0	0	702

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1265	0	0	1306	0	0	1938	2571	653	1918	2571	632
Stage 1	-	-	-	-	-	-	1306	1306	-	1265	1265	-
Stage 2	-	-	-	-	-	-	632	1265	-	653	1306	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	556	-	-	537	-	-	40	26	~ 415	42	26	~ 428
Stage 1	-	-	-	-	-	-	172	232	-	182	243	-
Stage 2	-	-	-	-	-	-	440	243	-	427	232	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	556	-	-	537	-	-	-	26	~ 415	-	26	~ 428
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	26	-	-	26	-
Stage 1	-	-	-	-	-	-	172	232	-	182	243	-
Stage 2	-	-	-	-	-	-	-	243	-	-	232	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	228.9	$ 321.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	415	556	-	-	537	-	-	428
HCM Lane V/C Ratio	1.421	-	-	-	-	-	-	1.64
HCM Control Delay (s)	228.9	0	-	-	0	-	-	$ 321.7
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	29.4	0	-	-	0	-	-	40.7

Notes

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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1795	44	33	1210	17	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	66.0	66.0	8.0	74.0	26.0	
Total Split (%)	66.0%	66.0%	8.0%	74.0%	26.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



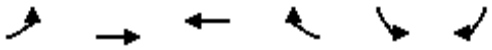
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1795	44	33	1210	17	21
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	1951	48	36	1315	18	23
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	3027	1354	46	3227	23	29
Arrive On Green	1.00	1.00	0.05	1.00	0.03	0.03
Sat Flow, veh/h	3705	1615	1810	3705	728	931
Grp Volume(v), veh/h	1951	48	36	1315	42	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1699	0
Q Serve(g_s), s	0.0	0.0	2.0	0.0	2.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	2.0	0.0	2.5	0.0
Prop In Lane		1.00	1.00		0.43	0.55
Lane Grp Cap(c), veh/h	3027	1354	46	3227	53	0
V/C Ratio(X)	0.64	0.04	0.79	0.41	0.79	0.00
Avail Cap(c_a), veh/h	3027	1354	90	3227	391	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	47.2	0.0	48.1	0.0
Incr Delay (d2), s/veh	1.1	0.0	10.5	0.4	22.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.5	0.0	1.1	0.2	1.5	0.0
LnGrp Delay(d),s/veh	1.1	0.0	57.7	0.4	70.9	0.0
LnGrp LOS	A	A	E	A	E	
Approach Vol, veh/h	1999			1351	42	
Approach Delay, s/veh	1.0			1.9	70.9	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.5	88.4				93.9		6.1
Change Period (Y+Rc), s	3.0	4.5				4.5		3.0
Max Green Setting (Gmax), s	5.0	61.5				69.5		23.0
Max Q Clear Time (g_c+I1), s	4.0	2.0				2.0		4.5
Green Ext Time (p_c), s	0.0	54.9				61.6		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	2.3
HCM 2010 LOS	A

Notes

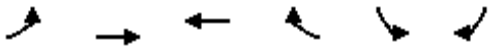
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	45	1752	1163	6	11	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	45	1752	1163	6	11	69
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	47	1844	1224	6	12	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.83				0.72	0.83
vC, conflicting volume	1231				2241	612
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	859				853	110
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				94	91
cM capacity (veh/h)	654				201	767

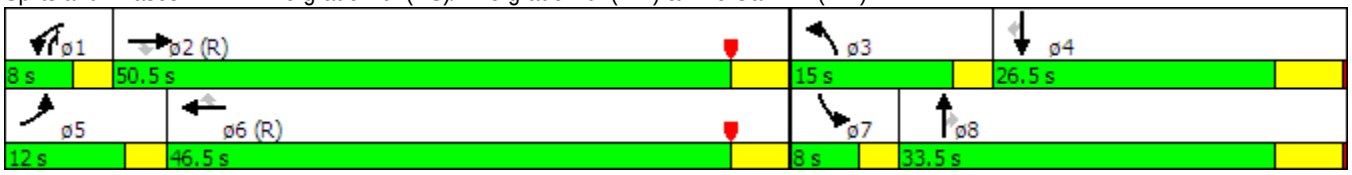
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	47	922	922	612	612	6	84
Volume Left	47	0	0	0	0	0	12
Volume Right	0	0	0	0	0	6	73
cSH	654	1700	1700	1700	1700	1700	553
Volume to Capacity	0.07	0.54	0.54	0.36	0.36	0.00	0.15
Queue Length 95th (ft)	6	0	0	0	0	0	13
Control Delay (s)	10.9	0.0	0.0	0.0	0.0	0.0	12.7
Lane LOS	B						B
Approach Delay (s)	0.3			0.0			12.7
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	77	1674	20	81	1018	6	97	64	361	26	20	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	12.0	50.5	50.5	8.0	46.5	46.5	15.0	33.5	8.0	8.0	26.5	26.5
Total Split (%)	12.0%	50.5%	50.5%	8.0%	46.5%	46.5%	15.0%	33.5%	8.0%	8.0%	26.5%	26.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	77	1674	20	81	1018	6	97	64	361	26	20	57
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	84	1820	0	88	1107	7	105	70	392	28	22	62
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	108	1852	828	90	1817	813	132	485	493	39	737	330
Arrive On Green	0.06	0.51	0.00	0.10	1.00	1.00	0.07	0.26	0.26	0.01	0.07	0.07
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	84	1820	0	88	1107	7	105	70	392	28	22	62
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	4.6	49.5	0.0	4.8	0.0	0.0	5.7	2.8	22.3	1.5	0.6	3.6
Cycle Q Clear(g_c), s	4.6	49.5	0.0	4.8	0.0	0.0	5.7	2.8	22.3	1.5	0.6	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	108	1852	828	90	1817	813	132	485	493	39	737	330
V/C Ratio(X)	0.78	0.98	0.00	0.97	0.61	0.01	0.79	0.14	0.79	0.72	0.03	0.19
Avail Cap(c_a), veh/h	163	1852	828	90	1817	813	217	532	533	90	758	339
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	23.9	0.0	44.9	0.0	0.0	45.6	28.8	31.8	49.3	37.4	38.8
Incr Delay (d2), s/veh	6.1	17.2	0.0	80.2	1.4	0.0	4.0	0.2	8.6	8.7	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	2.5	29.0	0.0	4.4	0.3	0.0	3.0	1.5	11.0	0.9	0.3	1.7
LnGrp Delay(d),s/veh	52.5	41.2	0.0	125.2	1.4	0.0	49.7	29.0	40.5	58.0	37.4	39.3
LnGrp LOS	D	D		F	A	A	D	C	D	E	D	D
Approach Vol, veh/h		1904			1202			567			112	
Approach Delay, s/veh		41.7			10.4			40.8			43.6	
Approach LOS		D			B			D			D	

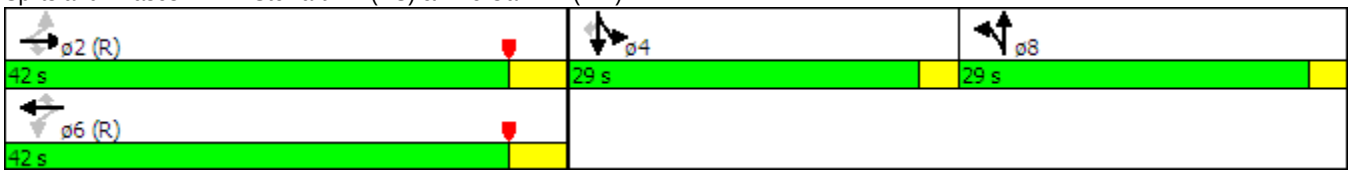
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	55.8	10.3	25.9	9.0	54.8	5.2	31.0
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	5.0	46.0	12.0	21.0	9.0	42.0	5.0	28.0
Max Q Clear Time (g_c+I1), s	6.8	51.5	7.7	5.6	6.6	2.0	3.5	24.3
Green Ext Time (p_c), s	0.0	0.0	0.0	3.4	0.0	36.5	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	1936	264	38	1002	1	68	19	11	23	99	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 19 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	58	1936	264	38	1002	1	68	19	11	23	99	13
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	63	2104	287	41	1089	1	74	21	12	25	108	14
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	460	2662	1191	182	2662	1191	97	28	16	144	151	128
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.08	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	526	3610	1615	149	3610	1615	1246	354	202	1810	1900	1615
Grp Volume(v), veh/h	63	2104	287	41	1089	1	107	0	0	25	108	14
Grp Sat Flow(s),veh/h/ln	526	1805	1615	149	1805	1615	1802	0	0	1810	1900	1615
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0	1.3	5.5	0.8
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0	1.3	5.5	0.8
Prop In Lane	1.00		1.00	1.00		1.00	0.69		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	460	2662	1191	182	2662	1191	141	0	0	144	151	128
V/C Ratio(X)	0.14	0.79	0.24	0.23	0.41	0.00	0.76	0.00	0.00	0.17	0.72	0.11
Avail Cap(c_a), veh/h	460	2662	1191	182	2662	1191	469	0	0	470	494	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.44	0.44	0.44	0.91	0.91	0.91	1.00	0.00	0.00	0.72	0.72	0.72
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	45.2	0.0	0.0	43.0	44.9	42.7
Incr Delay (d2), s/veh	0.3	1.1	0.2	2.6	0.4	0.0	8.1	0.0	0.0	0.4	4.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.4	0.1	0.1	0.2	0.0	3.2	0.0	0.0	0.7	3.1	0.4
LnGrp Delay(d),s/veh	0.3	1.1	0.2	2.6	0.4	0.0	53.3	0.0	0.0	43.4	49.4	43.0
LnGrp LOS	A	A	A	A	A	A	D			D	D	D
Approach Vol, veh/h		2454			1131			107			147	
Approach Delay, s/veh		1.0			0.5			53.3			47.8	
Approach LOS		A			A			D			D	

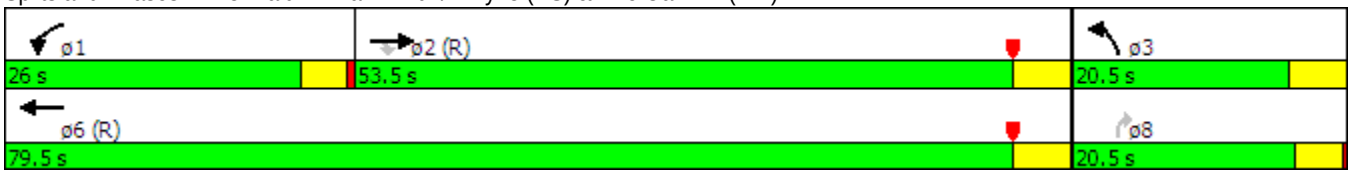
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		78.2		10.9		78.2		10.8
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		2.0		7.5		2.0		7.8
Green Ext Time (p_c), s		27.9		0.5		27.9		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	4.1
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1341	522	262	1088	94	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	200		100	0
Storage Lanes		1	1		1	1
Taper Length (ft)			60		60	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	1141			511	1039	
Travel Time (s)	17.3			7.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				8
Detector Phase	2	2	1	6	3	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	10.0	4.0
Minimum Split (s)	20.5	20.5	8.0	20.0	20.5	20.0
Total Split (s)	53.5	53.5	26.0	79.5	20.5	20.5
Total Split (%)	53.5%	53.5%	26.0%	79.5%	20.5%	20.5%
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5	3.5
All-Red Time (s)	0.0	0.0	0.5	0.0	0.0	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.0	4.5	4.5	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1341	522	262	1088	94	84
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	1458	567	285	1183	102	91
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1936	866	314	2708	562	258
Arrive On Green	0.36	0.36	0.35	1.00	0.16	0.16
Sat Flow, veh/h	3705	1615	1810	3705	3510	1615
Grp Volume(v), veh/h	1458	567	285	1183	102	91
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1755	1615
Q Serve(g_s), s	35.5	29.4	15.0	0.0	2.5	5.0
Cycle Q Clear(g_c), s	35.5	29.4	15.0	0.0	2.5	5.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1936	866	314	2708	562	258
V/C Ratio(X)	0.75	0.65	0.91	0.44	0.18	0.35
Avail Cap(c_a), veh/h	1936	866	398	2708	562	258
HCM Platoon Ratio	0.67	0.67	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.40	0.40	0.80	0.80	1.00	1.00
Uniform Delay (d), s/veh	26.2	24.3	31.9	0.0	36.3	37.4
Incr Delay (d2), s/veh	1.1	1.6	17.5	0.4	0.7	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	18.0	13.5	9.0	0.2	1.3	2.5
LnGrp Delay(d),s/veh	27.3	25.8	49.4	0.4	37.0	41.1
LnGrp LOS	C	C	D	A	D	D
Approach Vol, veh/h	2025			1468	193	
Approach Delay, s/veh	26.9			9.9	39.0	
Approach LOS	C			A	D	

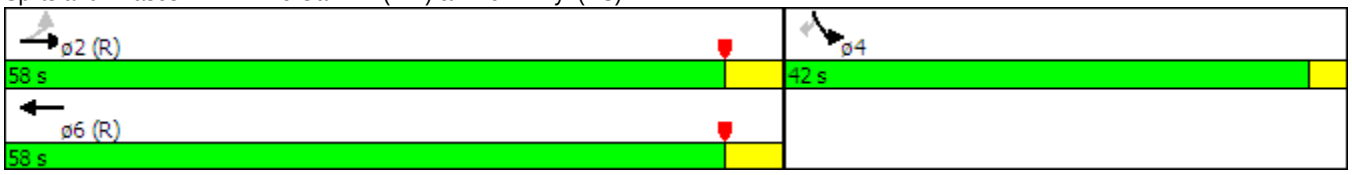
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	21.4	58.1				79.5		20.5
Change Period (Y+Rc), s	4.0	4.5				4.5		4.5
Max Green Setting (Gmax), s	22.0	49.0				75.0		16.0
Max Q Clear Time (g_c+I1), s	17.0	37.5				2.0		7.0
Green Ext Time (p_c), s	0.4	11.3				66.4		0.7

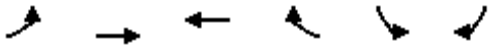
Intersection Summary	
HCM 2010 Ctrl Delay	20.8
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	42	1383	1216	0	973	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	20.0	20.0	28.5		27.0	27.0
Total Split (s)	58.0	58.0	58.0		42.0	42.0
Total Split (%)	58.0%	58.0%	58.0%		42.0%	42.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 21 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	42	1383	1216	0	973	134
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	43	1426	1254	0	1003	138
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	247	2171	2171	0	1136	523
Arrive On Green	0.40	0.40	0.60	0.00	0.32	0.32
Sat Flow, veh/h	450	3705	3800	0	3510	1615
Grp Volume(v), veh/h	43	1426	1254	0	1003	138
Grp Sat Flow(s),veh/h/ln	450	1805	1805	0	1755	1615
Q Serve(g_s), s	7.6	32.1	21.2	0.0	27.1	6.3
Cycle Q Clear(g_c), s	28.8	32.1	21.2	0.0	27.1	6.3
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	247	2171	2171	0	1136	523
V/C Ratio(X)	0.17	0.66	0.58	0.00	0.88	0.26
Avail Cap(c_a), veh/h	247	2171	2171	0	1369	630
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.57	0.57	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	21.5	12.2	0.0	32.0	25.0
Incr Delay (d2), s/veh	0.9	0.9	1.1	0.0	6.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.0	16.2	10.8	0.0	14.1	2.8
LnGrp Delay(d),s/veh	29.7	22.4	13.3	0.0	38.2	25.3
LnGrp LOS	C	C	B		D	C
Approach Vol, veh/h		1469	1254		1141	
Approach Delay, s/veh		22.6	13.3		36.7	
Approach LOS		C	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		64.6		35.4		64.6		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		53.5		39.0		53.5		
Max Q Clear Time (g_c+I1), s		34.1		29.1		23.2		
Green Ext Time (p_c), s		18.5		3.3		28.3		

Intersection Summary	
HCM 2010 Ctrl Delay	23.7
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1859	486	63	1806	249	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	80.0	80.0	80.0	80.0	20.0	20.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1859	486	63	1806	249	99
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2021	528	68	1963	271	108
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2708	1211	127	3890	562	258
Arrive On Green	0.75	0.75	0.75	0.75	0.16	0.16
Sat Flow, veh/h	3705	1615	127	5358	3510	1615
Grp Volume(v), veh/h	2021	528	68	1963	271	108
Grp Sat Flow(s),veh/h/ln	1805	1615	127	1729	1755	1615
Q Serve(g_s), s	31.8	12.1	43.2	15.2	7.0	6.0
Cycle Q Clear(g_c), s	31.8	12.1	75.0	15.2	7.0	6.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2708	1211	127	3890	562	258
V/C Ratio(X)	0.75	0.44	0.54	0.50	0.48	0.42
Avail Cap(c_a), veh/h	2708	1211	127	3890	562	258
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.1	4.6	32.6	5.0	38.2	37.8
Incr Delay (d2), s/veh	1.9	1.1	15.3	0.5	3.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	16.2	5.7	2.4	7.3	3.6	3.0
LnGrp Delay(d),s/veh	9.0	5.8	47.9	5.5	41.2	42.7
LnGrp LOS	A	A	D	A	D	D
Approach Vol, veh/h	2549			2031	379	
Approach Delay, s/veh	8.4			6.9	41.6	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		80.0				80.0		20.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		75.0				75.0		16.0
Max Q Clear Time (g_c+I1), s		33.8				77.0		9.0
Green Ext Time (p_c), s		41.1				0.0		0.8

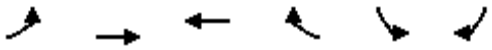
Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B

VOLUME-TO-CAPACITY RATIO



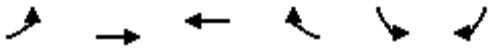
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	547	0	120	1643	912	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	595	0	130	1786	991	214
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	595	0	130	1786	991	214
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	48.5		7.4	59.9	32.1	100.0
Effective Green, g (s)	48.5		7.4	59.9	32.1	100.0
Actuated g/C Ratio	0.48		0.07	0.60	0.32	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1750		259	2162	1124	1615
v/s Ratio Prot	0.16		0.04	c0.49	c0.28	
v/s Ratio Perm						0.13
v/c Ratio	0.34		0.50	0.83	0.88	0.13
Uniform Delay, d1	15.9		44.5	15.9	32.2	0.0
Progression Factor	1.00		1.20	0.74	1.03	1.00
Incremental Delay, d2	0.5		0.3	1.4	7.8	0.2
Delay (s)	16.4		53.7	13.1	40.9	0.2
Level of Service	B		D	B	D	A
Approach Delay (s)	16.4			15.8	33.7	
Approach LOS	B			B	C	

Intersection Summary			
Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



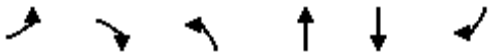
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	288	447	1638	643	120	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	313	486	1780	699	130	133
RTOR Reduction (vph)	0	0	0	270	0	121
Lane Group Flow (vph)	313	486	1780	429	130	12
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	27.3	80.4	50.1	50.1	9.1	9.1
Effective Green, g (s)	27.3	80.4	50.1	50.1	9.1	9.1
Actuated g/C Ratio	0.27	0.80	0.50	0.50	0.09	0.09
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	492	2902	1808	809	318	146
v/s Ratio Prot	c0.17	0.13	c0.49		c0.04	
v/s Ratio Perm				0.27		0.01
v/c Ratio	0.64	0.17	0.98	0.53	0.41	0.08
Uniform Delay, d1	32.0	2.2	24.6	16.9	42.9	41.6
Progression Factor	0.58	3.15	0.82	1.21	1.00	1.00
Incremental Delay, d2	1.9	0.1	14.6	1.8	0.9	0.2
Delay (s)	20.5	7.1	34.8	22.3	43.8	41.9
Level of Service	C	A	C	C	D	D
Approach Delay (s)		12.4	31.2		42.8	
Approach LOS		B	C		D	

Intersection Summary			
Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	567	1766	0	381	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	603	1879	0	405	548
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	603	1879	0	405	548
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		64.1	64.1		26.3	100.0
Effective Green, g (s)		64.1	64.1		26.3	100.0
Actuated g/C Ratio		0.64	0.64		0.26	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		3324	2314		474	1615
v/s Ratio Prot		0.12	c0.52		c0.22	
v/s Ratio Perm						0.34
v/c Ratio		0.18	0.81		0.85	0.34
Uniform Delay, d1		7.3	13.4		35.0	0.0
Progression Factor		1.79	0.87		1.00	1.00
Incremental Delay, d2		0.1	2.4		14.0	0.6
Delay (s)		13.2	14.1		49.0	0.6
Level of Service		B	B		D	A
Approach Delay (s)		13.2	14.1		21.1	
Approach LOS		B	B		C	

Intersection Summary			
Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	230	12	21	1885	410	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.49	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	938	3610	3610	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	13	23	2049	446	324
RTOR Reduction (vph)	0	11	0	0	0	68
Lane Group Flow (vph)	250	2	23	2049	446	256
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	12.4	12.4	79.1	79.1	79.1	79.1
Effective Green, g (s)	12.4	12.4	79.1	79.1	79.1	79.1
Actuated g/C Ratio	0.12	0.12	0.79	0.79	0.79	0.79
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	434	200	741	2855	2855	1277
v/s Ratio Prot	c0.07			c0.57	0.12	
v/s Ratio Perm		0.00	0.02			0.16
v/c Ratio	0.58	0.01	0.03	0.72	0.16	0.20
Uniform Delay, d1	41.3	38.4	2.2	5.1	2.5	2.6
Progression Factor	1.52	2.11	1.32	0.99	1.71	6.98
Incremental Delay, d2	1.9	0.0	0.0	0.9	0.1	0.3
Delay (s)	64.6	81.0	3.0	5.9	4.4	18.5
Level of Service	E	F	A	A	A	B
Approach Delay (s)	65.4			5.9	10.3	
Approach LOS	E			A	B	

Intersection Summary			
Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	114	10	92	261	11	10	9	85	7	6	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3567		1805	3589		1805	1642			1745	
Flt Permitted	0.40	1.00		0.66	1.00		0.74	1.00			0.96	
Satd. Flow (perm)	757	3567		1261	3589		1400	1642			1694	
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)	26	128	11	103	293	12	11	10	96	8	7	16
RTOR Reduction (vph)	0	9	0	0	5	0	0	22	0	0	4	0
Lane Group Flow (vph)	26	130	0	103	300	0	11	84	0	0	27	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)	14.7	14.7		14.7	14.7		76.8	76.8			76.8	
Effective Green, g (s)	14.7	14.7		14.7	14.7		76.8	76.8			76.8	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.77	0.77			0.77	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	111	524		185	527		1075	1261			1300	
v/s Ratio Prot		0.04			c0.08			c0.05				
v/s Ratio Perm	0.03			0.08			0.01				0.02	
v/c Ratio	0.23	0.25		0.56	0.57		0.01	0.07			0.02	
Uniform Delay, d1	37.7	37.8		39.6	39.7		2.7	2.8			2.7	
Progression Factor	0.80	0.80		0.81	0.77		0.33	0.08			1.00	
Incremental Delay, d2	1.0	0.2		3.6	1.4		0.0	0.1			0.0	
Delay (s)	31.1	30.3		35.7	32.1		0.9	0.3			2.8	
Level of Service	C	C		D	C		A	A			A	
Approach Delay (s)		30.4			33.0			0.4			2.8	
Approach LOS		C			C			A			A	

Intersection Summary			
Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	311	611	685	1353	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	331	650	729	1439	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	331	650	729	1439	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	22.5	100.0	66.4	100.0		
Effective Green, g (s)	22.5	100.0	66.4	100.0		
Actuated g/C Ratio	0.22	1.00	0.66	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	812	1615	1198	3610		
v/s Ratio Prot	0.09		c0.40	0.40		
v/s Ratio Perm		c0.40				
v/c Ratio	0.41	0.40	0.61	0.40		
Uniform Delay, d1	33.1	0.0	9.5	0.0		
Progression Factor	0.86	1.00	0.71	1.00		
Incremental Delay, d2	1.5	0.7	2.2	0.3		
Delay (s)	29.8	0.7	8.9	0.3		
Level of Service	C	A	A	A		
Approach Delay (s)	10.6			3.2	0.0	
Approach LOS	B			A	A	

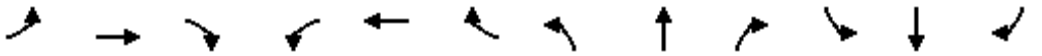
Intersection Summary			
Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	869	103	46	1294	148	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3610	1615	1805	3610	1766	
Flt Permitted	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (perm)	3610	1615	1805	3610	1766	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	945	112	50	1407	161	61
RTOR Reduction (vph)	0	16	0	0	16	0
Lane Group Flow (vph)	945	96	50	1407	206	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	67.7	67.7	4.9	75.6	16.9	
Effective Green, g (s)	67.7	67.7	4.9	75.6	16.9	
Actuated g/C Ratio	0.68	0.68	0.05	0.76	0.17	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2443	1093	88	2729	298	
v/s Ratio Prot	0.26		0.03	c0.39	c0.12	
v/s Ratio Perm		0.06				
v/c Ratio	0.39	0.09	0.57	0.52	0.69	
Uniform Delay, d1	7.1	5.5	46.5	4.9	39.1	
Progression Factor	0.83	0.85	0.71	2.45	1.00	
Incremental Delay, d2	0.5	0.2	4.5	0.6	6.8	
Delay (s)	6.3	4.9	37.4	12.6	45.9	
Level of Service	A	A	D	B	D	
Approach Delay (s)	6.2			13.5	45.9	
Approach LOS	A			B	D	

Intersection Summary			
Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	678	84	251	1158	13	40	49	104	29	74	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
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)	97	737	91	273	1259	14	43	53	113	32	80	76
RTOR Reduction (vph)	0	0	42	0	0	5	0	0	75	0	0	70
Lane Group Flow (vph)	97	737	49	273	1259	9	43	53	38	32	80	6
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	8.7	54.3	54.3	18.0	63.6	63.6	4.0	8.3	26.3	3.4	7.7	7.7
Effective Green, g (s)	8.7	54.3	54.3	18.0	63.6	63.6	4.0	8.3	26.3	3.4	7.7	7.7
Actuated g/C Ratio	0.09	0.54	0.54	0.18	0.64	0.64	0.04	0.08	0.26	0.03	0.08	0.08
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	157	1960	876	324	2295	1027	72	157	424	61	277	124
v/s Ratio Prot	0.05	0.20		c0.15	c0.35		c0.02	c0.03	0.02	0.02	0.02	
v/s Ratio Perm			0.03			0.01			0.01			0.00
v/c Ratio	0.62	0.38	0.06	0.84	0.55	0.01	0.60	0.34	0.09	0.52	0.29	0.05
Uniform Delay, d1	44.0	13.1	10.8	39.6	10.2	6.7	47.2	43.3	27.8	47.5	43.6	42.8
Progression Factor	0.93	0.68	2.45	1.26	0.36	1.00	1.00	1.00	1.00	0.41	0.20	0.16
Incremental Delay, d2	4.7	0.5	0.1	11.5	0.6	0.0	8.6	2.2	0.0	3.7	1.0	0.3
Delay (s)	45.6	9.5	26.5	61.3	4.3	6.7	55.8	45.5	27.8	23.2	9.6	7.2
Level of Service	D	A	C	E	A	A	E	D	C	C	A	A
Approach Delay (s)		15.0			14.3			38.1			10.9	
Approach LOS		B			B			D			B	

Intersection Summary				
Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	57.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

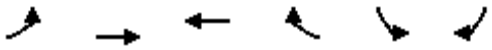


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	623	26	17	1503	35	210	118	32	13	26	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1824		1805	1900	1615
Flt Permitted	0.07	1.00	1.00	0.35	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	134	3610	1615	668	3610	1615		1824		1805	1900	1615
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)	21	677	28	18	1634	38	228	128	35	14	28	83
RTOR Reduction (vph)	0	0	12	0	0	14	0	4	0	0	0	78
Lane Group Flow (vph)	21	677	16	18	1634	24	0	387	0	14	28	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	56.9	56.9	56.9	56.9	56.9	56.9		26.5		6.1	6.1	6.1
Effective Green, g (s)	56.9	56.9	56.9	56.9	56.9	56.9		26.5		6.1	6.1	6.1
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.57	0.57		0.26		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	76	2054	918	380	2054	918		483		110	115	98
v/s Ratio Prot		0.19			c0.45			c0.21		0.01	c0.01	
v/s Ratio Perm	0.16		0.01	0.03		0.01						0.00
v/c Ratio	0.28	0.33	0.02	0.05	0.80	0.03		0.80		0.13	0.24	0.05
Uniform Delay, d1	11.0	11.4	9.4	9.5	17.0	9.4		34.3		44.4	44.8	44.2
Progression Factor	1.96	1.90	3.92	1.13	0.93	1.26		1.00		1.89	1.85	4.34
Incremental Delay, d2	8.4	0.4	0.0	0.2	2.7	0.0		9.3		0.5	1.1	0.2
Delay (s)	30.1	22.1	36.8	11.0	18.4	11.9		43.6		84.3	84.0	192.0
Level of Service	C	C	D	B	B	B		D		F	F	F
Approach Delay (s)		22.9			18.2			43.6			155.8	
Approach LOS		C			B			D			F	

Intersection Summary				
Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	76.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	525	63	131	1376	296	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	571	68	142	1496	322	315
RTOR Reduction (vph)	0	23	0	0	0	235
Lane Group Flow (vph)	571	45	142	1496	322	80
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	48.6	48.6	12.9	65.5	25.5	25.5
Effective Green, g (s)	48.6	48.6	12.9	65.5	25.5	25.5
Actuated g/C Ratio	0.49	0.49	0.13	0.66	0.26	0.26
Clearance Time (s)	4.5	4.5	4.0	4.5	4.5	4.5
Vehicle Extension (s)	4.5	4.5	3.0	4.5	4.5	4.5
Lane Grp Cap (vph)	1754	784	232	2364	893	411
v/s Ratio Prot	0.16		0.08	c0.41	c0.09	
v/s Ratio Perm		0.03				0.05
v/c Ratio	0.33	0.06	0.61	0.63	0.36	0.20
Uniform Delay, d1	15.7	13.6	41.2	10.2	30.6	29.2
Progression Factor	0.36	0.10	1.12	0.70	1.00	1.00
Incremental Delay, d2	0.5	0.1	4.2	1.2	1.1	1.1
Delay (s)	6.1	1.5	50.4	8.3	31.7	30.3
Level of Service	A	A	D	A	C	C
Approach Delay (s)	5.6			12.0	31.0	
Approach LOS	A			B	C	

Intersection Summary			
Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	99	716	1442	0	357	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.14	1.00	1.00		0.95	1.00
Satd. Flow (perm)	275	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	102	738	1487	0	368	67
RTOR Reduction (vph)	0	0	0	0	0	51
Lane Group Flow (vph)	102	738	1487	0	368	16
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	76.7	76.7	76.7		15.8	15.8
Effective Green, g (s)	76.7	76.7	76.7		15.8	15.8
Actuated g/C Ratio	0.77	0.77	0.77		0.16	0.16
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	210	2768	2768		553	255
v/s Ratio Prot		0.20	c0.41		c0.11	
v/s Ratio Perm	0.37					0.01
v/c Ratio	0.49	0.27	0.54		0.67	0.06
Uniform Delay, d1	4.3	3.4	4.6		39.6	35.8
Progression Factor	0.79	0.27	0.78		0.78	0.88
Incremental Delay, d2	7.4	0.2	0.4		3.0	0.1
Delay (s)	10.8	1.1	4.0		33.9	31.5
Level of Service	B	A	A		C	C
Approach Delay (s)		2.3	4.0		33.5	
Approach LOS		A	A		C	

Intersection Summary			
Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

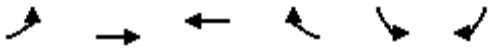
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	781	107	34	2637	612	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.30	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	573	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	849	116	37	2866	665	113
RTOR Reduction (vph)	0	28	0	0	0	35
Lane Group Flow (vph)	849	88	37	2866	665	78
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	66.0	66.0	66.0	66.0	25.0	25.0
Effective Green, g (s)	66.0	66.0	66.0	66.0	25.0	25.0
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.25	0.25
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2382	1065	378	3423	875	403
v/s Ratio Prot	0.24			c0.55	c0.19	
v/s Ratio Perm		0.05	0.06			0.05
v/c Ratio	0.36	0.08	0.10	0.84	0.76	0.19
Uniform Delay, d1	7.6	6.1	6.2	12.9	34.7	29.6
Progression Factor	0.55	0.61	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.5	2.6	6.2	1.1
Delay (s)	4.6	3.9	6.7	15.5	40.9	30.6
Level of Service	A	A	A	B	D	C
Approach Delay (s)	4.5			15.4	39.4	
Approach LOS	A			B	D	

Intersection Summary			
Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



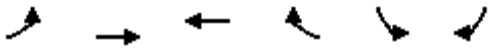
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	865	0	237	893	821	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	940	0	258	971	892	127
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	940	0	258	971	892	127
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	45.8		11.2	61.0	31.0	100.0
Effective Green, g (s)	45.8		11.2	61.0	31.0	100.0
Actuated g/C Ratio	0.46		0.11	0.61	0.31	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1653		392	2202	1085	1615
v/s Ratio Prot	c0.26		c0.07	0.27	c0.25	
v/s Ratio Perm						0.08
v/c Ratio	0.57		0.66	0.44	0.82	0.08
Uniform Delay, d1	19.9		42.6	10.4	31.9	0.0
Progression Factor	1.00		1.32	0.61	1.24	1.00
Incremental Delay, d2	1.4		2.9	0.6	4.8	0.1
Delay (s)	21.3		59.1	6.9	44.3	0.1
Level of Service	C		E	A	D	A
Approach Delay (s)	21.3			17.9	38.8	
Approach LOS	C			B	D	

Intersection Summary			
Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



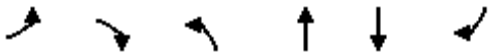
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	188	792	825	198	361	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	204	861	897	215	392	337
RTOR Reduction (vph)	0	0	0	98	0	280
Lane Group Flow (vph)	204	861	897	117	392	57
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	15.1	72.7	54.6	54.6	16.8	16.8
Effective Green, g (s)	15.1	72.7	54.6	54.6	16.8	16.8
Actuated g/C Ratio	0.15	0.73	0.55	0.55	0.17	0.17
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	272	2624	1971	881	588	271
v/s Ratio Prot	c0.11	0.24	c0.25		c0.11	
v/s Ratio Perm				0.07		0.04
v/c Ratio	0.75	0.33	0.46	0.13	0.67	0.21
Uniform Delay, d1	40.6	4.9	13.7	11.1	39.0	35.9
Progression Factor	0.50	2.93	0.79	0.90	1.00	1.00
Incremental Delay, d2	8.7	0.3	0.7	0.3	2.9	0.4
Delay (s)	29.1	14.6	11.6	10.3	41.8	36.3
Level of Service	C	B	B	B	D	D
Approach Delay (s)		17.4	11.4		39.3	
Approach LOS		B	B		D	

Intersection Summary			
Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	1153	717	0	278	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1253	779	0	302	333
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1253	779	0	302	333
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		68.0	68.0		22.4	100.0
Effective Green, g (s)		68.0	68.0		22.4	100.0
Actuated g/C Ratio		0.68	0.68		0.22	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		3527	2454		404	1615
v/s Ratio Prot		c0.24	0.22		c0.17	
v/s Ratio Perm						0.21
v/c Ratio		0.36	0.32		0.75	0.21
Uniform Delay, d1		6.8	6.5		36.2	0.0
Progression Factor		1.39	0.86		1.00	1.00
Incremental Delay, d2		0.3	0.3		7.4	0.3
Delay (s)		9.7	5.9		43.5	0.3
Level of Service		A	A		D	A
Approach Delay (s)		9.7	5.9		20.9	
Approach LOS		A	A		C	

Intersection Summary			
Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	154	17	19	862	1090	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.24	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	455	3610	3610	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	160	18	20	898	1135	147
RTOR Reduction (vph)	0	16	0	0	0	27
Lane Group Flow (vph)	160	2	20	898	1135	120
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	9.9	9.9	81.6	81.6	81.6	81.6
Effective Green, g (s)	9.9	9.9	81.6	81.6	81.6	81.6
Actuated g/C Ratio	0.10	0.10	0.82	0.82	0.82	0.82
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	346	159	371	2945	2945	1317
v/s Ratio Prot	c0.05			0.25	c0.31	
v/s Ratio Perm		0.00	0.04			0.07
v/c Ratio	0.46	0.01	0.05	0.30	0.39	0.09
Uniform Delay, d1	42.5	40.6	1.8	2.3	2.5	1.8
Progression Factor	1.25	1.38	0.94	0.89	2.21	7.68
Incremental Delay, d2	1.0	0.0	0.2	0.2	0.4	0.1
Delay (s)	54.3	55.9	1.9	2.2	5.8	14.2
Level of Service	D	E	A	A	A	B
Approach Delay (s)	54.4			2.2	6.8	
Approach LOS	D			A	A	

Intersection Summary			
Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	132	38	296	67	3	1	2	65	4	21	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.86			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1805	3489		1805	3586		1805	1625			1796	
Flt Permitted	0.69	1.00		0.61	1.00		0.72	1.00			0.98	
Satd. Flow (perm)	1320	3489		1167	3586		1375	1625			1777	
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)	3	171	49	384	87	4	1	3	84	5	27	19
RTOR Reduction (vph)	0	27	0	0	2	0	0	46	0	0	10	0
Lane Group Flow (vph)	3	193	0	384	89	0	1	41	0	0	41	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)	45.7	45.7		45.7	45.7		45.8	45.8			45.8	
Effective Green, g (s)	45.7	45.7		45.7	45.7		45.8	45.8			45.8	
Actuated g/C Ratio	0.46	0.46		0.46	0.46		0.46	0.46			0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	603	1594		533	1638		629	744			813	
v/s Ratio Prot		0.06			0.02			c0.03				
v/s Ratio Perm	0.00			c0.33			0.00				0.02	
v/c Ratio	0.00	0.12		0.72	0.05		0.00	0.06			0.05	
Uniform Delay, d1	14.8	15.6		22.0	15.1		14.7	15.1			15.0	
Progression Factor	2.14	1.98		0.85	0.80		0.83	0.57			1.00	
Incremental Delay, d2	0.0	0.0		4.8	0.0		0.0	0.1			0.1	
Delay (s)	31.6	30.9		23.4	12.1		12.2	8.8			15.1	
Level of Service	C	C		C	B		B	A			B	
Approach Delay (s)		30.9			21.3			8.8			15.1	
Approach LOS		C			C			A			B	

Intersection Summary			
Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1267	978	573	1335	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1362	1052	616	1435	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1362	1052	616	1435	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	45.5	100.0	43.4	100.0		
Effective Green, g (s)	45.5	100.0	43.4	100.0		
Actuated g/C Ratio	0.46	1.00	0.43	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	1642	1615	783	3610		
v/s Ratio Prot	c0.38		c0.34	0.40		
v/s Ratio Perm		0.65				
v/c Ratio	0.83	0.65	0.79	0.40		
Uniform Delay, d1	23.9	0.0	24.3	0.0		
Progression Factor	0.86	1.00	0.80	1.00		
Incremental Delay, d2	5.0	2.1	7.7	0.3		
Delay (s)	25.5	2.1	27.1	0.3		
Level of Service	C	A	C	A		
Approach Delay (s)	15.3			8.4	0.0	
Approach LOS	B			A	A	

Intersection Summary			
Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1795	44	33	1210	17	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.92	
Flt Protected	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)	3610	1615	1805	3610	1718	
Flt Permitted	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (perm)	3610	1615	1805	3610	1718	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1951	48	36	1315	18	23
RTOR Reduction (vph)	0	2	0	0	22	0
Lane Group Flow (vph)	1951	46	36	1315	19	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	81.3	81.3	3.5	87.8	4.7	
Effective Green, g (s)	81.3	81.3	3.5	87.8	4.7	
Actuated g/C Ratio	0.81	0.81	0.04	0.88	0.05	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2934	1312	63	3169	80	
v/s Ratio Prot	c0.54		c0.02	0.36	c0.01	
v/s Ratio Perm		0.03				
v/c Ratio	0.66	0.03	0.57	0.41	0.24	
Uniform Delay, d1	3.8	1.8	47.5	1.2	45.9	
Progression Factor	1.12	1.08	0.84	3.54	1.00	
Incremental Delay, d2	1.0	0.0	7.0	0.4	1.5	
Delay (s)	5.3	2.0	47.0	4.5	47.5	
Level of Service	A	A	D	A	D	
Approach Delay (s)	5.2			5.6	47.5	
Approach LOS	A			A	D	

Intersection Summary			
Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	77	1674	20	81	1018	6	97	64	361	26	20	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
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)	84	1820	22	88	1107	7	105	70	392	28	22	62
RTOR Reduction (vph)	0	0	9	0	0	3	0	0	63	0	0	58
Lane Group Flow (vph)	84	1820	13	88	1107	4	105	70	329	28	22	4
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	8.0	57.8	57.8	11.7	61.5	61.5	8.3	11.7	23.4	2.8	6.2	6.2
Effective Green, g (s)	8.0	57.8	57.8	11.7	61.5	61.5	8.3	11.7	23.4	2.8	6.2	6.2
Actuated g/C Ratio	0.08	0.58	0.58	0.12	0.62	0.62	0.08	0.12	0.23	0.03	0.06	0.06
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	144	2086	933	211	2220	993	149	222	377	50	223	100
v/s Ratio Prot	0.05	c0.50		0.05	0.31		c0.06	0.04	c0.10	0.02	0.01	
v/s Ratio Perm			0.01			0.00			0.10			0.00
v/c Ratio	0.58	0.87	0.01	0.42	0.50	0.00	0.70	0.32	0.87	0.56	0.10	0.04
Uniform Delay, d1	44.4	18.0	9.0	41.0	10.7	7.4	44.7	40.5	36.9	48.0	44.3	44.1
Progression Factor	1.06	0.56	1.00	1.28	0.66	1.00	1.00	1.00	1.00	0.88	0.88	1.00
Incremental Delay, d2	3.1	4.4	0.0	0.5	0.7	0.0	11.7	1.4	18.9	8.3	0.3	0.3
Delay (s)	50.0	14.5	9.0	52.8	7.8	7.4	56.3	41.9	55.8	50.6	39.2	44.4
Level of Service	D	B	A	D	A	A	E	D	E	D	D	D
Approach Delay (s)		16.0			11.1			54.2			44.9	
Approach LOS		B			B			D			D	

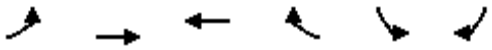
Intersection Summary				
Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	1936	264	38	1002	1	68	19	11	23	99	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1809		1805	1900	1615
Flt Permitted	0.22	1.00	1.00	0.06	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	420	3610	1615	112	3610	1615		1809		1805	1900	1615
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)	63	2104	287	41	1089	1	74	21	12	25	108	14
RTOR Reduction (vph)	0	0	53	0	0	0	0	5	0	0	0	12
Lane Group Flow (vph)	63	2104	234	41	1089	1	0	102	0	25	108	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	67.6	67.6	67.6	67.6	67.6	67.6		10.9		11.0	11.0	11.0
Effective Green, g (s)	67.6	67.6	67.6	67.6	67.6	67.6		10.9		11.0	11.0	11.0
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.68	0.68		0.11		0.11	0.11	0.11
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	283	2440	1091	75	2440	1091		197		198	209	177
v/s Ratio Prot		c0.58			0.30			c0.06		0.01	c0.06	
v/s Ratio Perm	0.15		0.14	0.36		0.00						0.00
v/c Ratio	0.22	0.86	0.21	0.55	0.45	0.00		0.52		0.13	0.52	0.01
Uniform Delay, d1	6.2	12.6	6.1	8.3	7.5	5.3		42.1		40.2	42.0	39.6
Progression Factor	1.51	1.22	2.07	0.82	0.72	1.00		1.00		0.79	0.74	1.00
Incremental Delay, d2	1.1	2.8	0.3	24.0	0.5	0.0		2.3		0.3	2.0	0.0
Delay (s)	10.4	18.1	13.0	30.8	6.0	5.3		44.3		31.9	33.2	39.7
Level of Service	B	B	B	C	A	A		D		C	C	D
Approach Delay (s)		17.3			6.9			44.3			33.6	
Approach LOS		B			A			D			C	

Intersection Summary				
Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	72.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1341	522	262	1088	94	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1458	567	285	1183	102	91
RTOR Reduction (vph)	0	76	0	0	0	76
Lane Group Flow (vph)	1458	491	285	1183	102	15
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				8
Actuated Green, G (s)	51.5	51.5	19.5	75.0	16.0	16.5
Effective Green, g (s)	51.5	51.5	19.5	75.0	16.0	16.5
Actuated g/C Ratio	0.52	0.52	0.20	0.75	0.16	0.16
Clearance Time (s)	4.5	4.5	4.0	4.5	4.5	4.0
Vehicle Extension (s)	4.5	4.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	1859	831	351	2707	560	266
v/s Ratio Prot	c0.40		c0.16	0.33	c0.03	
v/s Ratio Perm		0.30				0.01
v/c Ratio	0.78	0.59	0.81	0.44	0.18	0.06
Uniform Delay, d1	19.7	16.9	38.5	4.6	36.3	35.2
Progression Factor	0.97	1.13	1.03	1.08	1.00	1.00
Incremental Delay, d2	1.7	1.6	11.6	0.4	0.7	0.1
Delay (s)	20.9	20.7	51.2	5.4	37.1	35.3
Level of Service	C	C	D	A	D	D
Approach Delay (s)	20.9			14.3	36.2	
Approach LOS	C			B	D	

Intersection Summary			
Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	42	1383	1216	0	973	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.15	1.00	1.00		0.95	1.00
Satd. Flow (perm)	278	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	43	1426	1254	0	1003	138
RTOR Reduction (vph)	0	0	0	0	0	31
Lane Group Flow (vph)	43	1426	1254	0	1003	107
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	58.0	58.0	58.0		34.5	34.5
Effective Green, g (s)	58.0	58.0	58.0		34.5	34.5
Actuated g/C Ratio	0.58	0.58	0.58		0.34	0.34
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	161	2093	2093		1208	557
v/s Ratio Prot		c0.40	0.35		c0.29	
v/s Ratio Perm	0.15					0.07
v/c Ratio	0.27	0.68	0.60		0.83	0.19
Uniform Delay, d1	10.4	14.6	13.5		30.1	23.0
Progression Factor	0.16	0.36	1.15		0.73	0.67
Incremental Delay, d2	2.6	1.2	1.1		4.7	0.2
Delay (s)	4.2	6.5	16.7		26.7	15.7
Level of Service	A	A	B		C	B
Approach Delay (s)		6.4	16.7		25.4	
Approach LOS		A	B		C	

Intersection Summary			
Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1859	486	63	1806	249	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	113	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2021	528	68	1963	271	108
RTOR Reduction (vph)	0	54	0	0	0	24
Lane Group Flow (vph)	2021	475	68	1963	271	84
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	75.0	75.0	75.0	75.0	16.0	16.0
Effective Green, g (s)	75.0	75.0	75.0	75.0	16.0	16.0
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.16	0.16
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2707	1211	84	3890	560	258
v/s Ratio Prot	0.56			0.38	c0.08	
v/s Ratio Perm		0.29	c0.60			0.05
v/c Ratio	0.75	0.39	0.81	0.50	0.48	0.33
Uniform Delay, d1	7.1	4.4	8.0	5.0	38.2	37.2
Progression Factor	0.64	0.82	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.7	55.3	0.5	3.0	3.4
Delay (s)	6.0	4.3	63.3	5.5	41.2	40.6
Level of Service	A	A	E	A	D	D
Approach Delay (s)	5.6			7.4	41.0	
Approach LOS	A			A	D	

Intersection Summary			
Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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APPENDIX F:

EXISTING (2016) CONDITIONS HCS2010 FREEWAY SEGMENT, HCS2010 RAMP JUNCTION, AND QUEUING ANALYSIS WORKSHEETS

HCS2010 FREEWAY SEGMENT ANALYSIS WORKSHEETS

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*06/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4188*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1178*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*06/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2931*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*824*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*11.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW EB Arrw Lp On and WB On*
Date Performed	*06/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3228*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*908*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*13.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3536*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*994*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*14.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow Hwy*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4721*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1328*	pc/h/ln
S	*69.8*	mph
D = v_p / S	*19.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbond*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3825*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1076*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*South of Live Oak Ave*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5121*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1410*	pc/h/ln
S	*69.5*	mph
D = v_p / S	*20.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*South of Live Oak Ave*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4183*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1176*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2930*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = $1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*824*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*11.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3037*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*854*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*12.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3359*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*945*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*13.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4530*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1274*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbond*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3946*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1110*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.9*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5497*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1546*	pc/h/ln
S	*68.6*	mph
D = v_p / S	*22.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*East of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7524*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2116*	pc/h/ln
S	*60.3*	mph
D = v_p / S	*35.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6925*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1948*	pc/h/ln
S	*63.5*	mph
D = v_p / S	*30.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7926*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*		E_R	*1.2*
E_T	*1.5*		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*4*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2229*	pc/h/ln	Design LOS	
S	*57.7*	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
D = v_p / S	*38.6*	pc/mi/ln	S	mph
LOS	*E*		D = v_p / S	pc/mi/ln
			Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*West of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7752*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2180*	pc/h/ln
S	*58.9*	mph
D = v_p / S	*37.0*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing (2013)*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6213*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1747*	pc/h/ln
S	*66.5*	mph
D = v_p / S	*26.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*East of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6982*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1964*	pc/h/ln
S	*63.2*	mph
D = v_p / S	*31.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6459*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1817*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6459*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1817*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*West of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7190*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2022*	pc/h/ln
S	*62.2*	mph
D = v_p / S	*32.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6445*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1813*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5623*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1581*	pc/h/ln
S	*68.3*	mph
D = v_p / S	*23.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing (2013)*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6522*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1834*	pc/h/ln
S	*65.3*	mph
D = v_p / S	*28.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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HCS2010 RAMP JUNCTION ANALYSIS WORKSHEETS

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 297 veh/h
	Freeway Volume, V_F: 4188	
	Ramp Volume, V_R: 1257	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4188	0.92	Level	7	0	0.966	1.00	4711
Ramp	1257	0.92	Level	0	0	1.000	1.00	1366
UpStream								
DownStream	297	0.92	Level	0	0	1.000	1.00	323

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 2824 pc/h

V_3 or V_{av34} 943 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4711	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	3345	Exhibit 13-8	9600	No
V_R	1366	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2824	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 26.2 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.551 (Exhibit 13-12)

S_R = 54.6 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 61.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = 1000 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 308 veh/h
	Freeway Volume, V_F: 2931	
	Ramp Volume, V_R: 297	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2931	0.92	Level	7	0	0.966	1.00	3297
Ramp	297	0.92	Level	0	0	1.000	1.00	323
UpStream								
DownStream	308	0.92	Level	0	0	1.000	1.00	335

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.177 using Equation (Exhibit 13-6)

V_{12} = 585 pc/h

V_3 or V_{av34} = 1356 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1318 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3620	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1641	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 13.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.292 (Exibit 13-11)

S_R = 61.8 mph (Exhibit 13-11)

S_0 = 68.2 mph (Exhibit 13-11)

S = 65.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	730	☑ No	☐ Off
L_{up} =	1000 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	297 veh/h	Freeway Volume, V_F	3228	V_D =	veh/h
		Ramp Volume, V_R	308		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3228	0.92	Level	7	0	0.966	1.00	3631
Ramp	308	0.92	Level	0	0	1.000	1.00	335
UpStream	297	0.92	Level	0	0	1.000	1.00	323
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.176 using Equation (Exhibit 13-6)

V_{12} = 639 pc/h

V_3 or V_{av34} 1496 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1452 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3966	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1787	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 14.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.293 (Exibit 13-11)

S_R= 61.8 mph (Exhibit 13-11)

S_0= 67.9 mph (Exhibit 13-11)

S = 65.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4300 ft
V_u = veh/h	Deceleration Lane Length L_D: 230	V_D = 1296 veh/h
	Freeway Volume, V_F: 4721	
	Ramp Volume, V_R: 896	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4721	0.92	Level	7	0	0.966	1.00	5311
Ramp	896	0.92	Level	0	0	1.000	1.00	974
UpStream								
DownStream	1296	0.92	Level	0	0	1.000	1.00	1409

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 2865 pc/h

V_3 or V_{av34} 1223 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5311	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	4337	Exhibit 13-8	9600	No
V_R	974	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2865	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 26.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.516 (Exhibit 13-12)

S_R = 55.6 mph (Exhibit 13-12)

S_0 = 75.9 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 896 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3825	
	Ramp Volume, V_R: 1296	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3825	0.92	Level	7	0	0.966	1.00	4303
Ramp	1296	0.92	Level	0	0	1.000	1.00	1409
UpStream	896	0.92	Level	0	0	1.000	1.00	974
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.042 using Equation (Exhibit 13-6)

V_{12} = 179 pc/h

V_3 or V_{av34} 2062 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1721 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5712	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3130	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 24.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.361 (Exibit 13-11)

S_R= 59.9 mph (Exhibit 13-11)

S_0= 67.2 mph (Exhibit 13-11)

S = 63.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 107 veh/h
	Freeway Volume, V_F: 4183	
	Ramp Volume, V_R: 1253	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4183	0.92	Level	7	0	0.966	1.00	4706
Ramp	1253	0.92	Level	0	0	1.000	1.00	1362
UpStream								
DownStream	107	0.92	Level	0	0	1.000	1.00	116

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 2820 pc/h

V_3 or V_{av34} 943 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4706	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	3344	Exhibit 13-8	9600	No
V_R	1362	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2820	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 26.2 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.551 (Exhibit 13-12)

S_R = 54.6 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 61.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = 1000 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 322 veh/h
	Freeway Volume, V_F: 2930	
	Ramp Volume, V_R: 107	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2930	0.92	Level	7	0	0.966	1.00	3296
Ramp	107	0.92	Level	0	0	1.000	1.00	116
UpStream								
DownStream	322	0.92	Level	0	0	1.000	1.00	350

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.203 using Equation (Exhibit 13-6)

V_{12} = 670 pc/h

V_3 or V_{av34} = 1313 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1318 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3412	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1434	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 12.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.288 (Exibit 13-11)

S_R = 61.9 mph (Exhibit 13-11)

S_0 = 68.2 mph (Exhibit 13-11)

S = 65.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	730	☑ No	☐ Off
L_{up} =	1000 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	322 veh/h	Freeway Volume, V_F	3037	V_D =	veh/h
		Ramp Volume, V_R	107		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3037	0.92	Level	7	0	0.966	1.00	3417
Ramp	107	0.92	Level	0	0	1.000	1.00	116
UpStream	322	0.92	Level	0	0	1.000	1.00	350
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.203 using Equation (Exhibit 13-6)

V_{12} = 695 pc/h

V_3 or V_{av34} 1361 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1366 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3533	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1482	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 12.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.287 (Exibit 13-11)

S_R= 62.0 mph (Exhibit 13-11)

S_0= 68.1 mph (Exhibit 13-11)

S = 65.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4300 ft
V_u = veh/h	Deceleration Lane Length L_D: 230	V_D = 1551 veh/h
	Freeway Volume, V_F: 4530	
	Ramp Volume, V_R: 584	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4530	0.92	Level	7	0	0.966	1.00	5096
Ramp	584	0.92	Level	0	0	1.000	1.00	635
UpStream								
DownStream	1551	0.92	Level	0	0	1.000	1.00	1686

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 2580 pc/h

V_3 or V_{av34} 1258 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5096	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	4461	Exhibit 13-8	9600	No
V_R	635	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2580	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 24.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.485 (Exhibit 13-12)

S_R = 56.4 mph (Exhibit 13-12)

S_0 = 75.8 mph (Exhibit 13-12)

S = 64.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 584 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3946	
	Ramp Volume, V_R: 1551	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3946	0.92	Level	7	0	0.966	1.00	4439
Ramp	1551	0.92	Level	0	0	1.000	1.00	1686
UpStream	584	0.92	Level	0	0	1.000	1.00	635
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.007 using Equation (Exhibit 13-6)

V_{12} = 31 pc/h

V_3 or V_{av34} 2204 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1775 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6125	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3461	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 27.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.396 (Exibit 13-11)

S_R= 58.9 mph (Exhibit 13-11)

S_0= 67.0 mph (Exhibit 13-11)

S = 62.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7524	
	Ramp Volume, V_R: 599	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7524	0.92	Level	7	0	0.966	1.00	8464
Ramp	599	0.92	Level	0	0	1.000	1.00	651
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4057 pc/h

V_3 or V_{av34} 2203 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8464	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7813	Exhibit 13-8	9600	No
V_R	651	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4057	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.5 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.487 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= 72.1 mph (Exhibit 13-12)

S = 63.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6925	
	Ramp Volume, V_R: 540	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6925	0.92	Level	7	0	0.966	1.00	7791
Ramp	540	0.92	Level	0	0	1.000	1.00	587
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.144 using Equation (Exhibit 13-6)

V_{12} = 1125 pc/h

V_3 or V_{av34} 3333 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3116 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8378	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3703	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 31.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.444 (Exibit 13-11)

S_R= 57.6 mph (Exhibit 13-11)

S_0= 63.2 mph (Exhibit 13-11)

S = 60.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7465	
	Ramp Volume, V_R: 461	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7465	0.92	Level	7	0	0.966	1.00	8398
Ramp	461	0.92	Level	0	0	1.000	1.00	501
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.155 using Equation (Exhibit 13-6)

V_{12} = 1303 pc/h

V_3 or V_{av34} 3547 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3359 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8899	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3860	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 31.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.457 (Exibit 13-11)

S_R= 57.2 mph (Exhibit 13-11)

S_0= 62.2 mph (Exhibit 13-11)

S = 59.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7752	
	Ramp Volume, V_R: 1539	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7752	0.92	Level	7	0	0.966	1.00	8721
Ramp	1539	0.92	Level	0	0	1.000	1.00	1673
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 3505 pc/h

V_3 or V_{av34} 2608 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8721	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7048	Exhibit 13-8	9600	No
V_R	1673	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3505	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 22.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.579 (Exhibit 13-12)

S_R= 53.8 mph (Exhibit 13-12)

S_0= 70.5 mph (Exhibit 13-12)

S = 62.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6213	
	Ramp Volume, V_R: 485	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6213	0.92	Level	7	0	0.966	1.00	6990
Ramp	485	0.92	Level	0	0	1.000	1.00	527
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.152 using Equation (Exhibit 13-6)

V_{12} = 1062 pc/h

V_3 or V_{av34} 2964 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2796 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7517	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3323	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.5 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.366 (Exibit 13-11)

S_R= 59.7 mph (Exhibit 13-11)

S_0= 64.3 mph (Exhibit 13-11)

S = 62.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 6982	
	Ramp Volume, V_R: 523	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6982	0.92	Level	7	0	0.966	1.00	7855
Ramp	523	0.92	Level	0	0	1.000	1.00	568
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3745 pc/h

V_3 or V_{av34} 2055 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7855	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7287	Exhibit 13-8	9600	No
V_R	568	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3745	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.479 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= 72.7 mph (Exhibit 13-12)

S = 64.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2013)

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6459	
	Ramp Volume, V_R: 448	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6459	0.92	Level	7	0	0.966	1.00	7266
Ramp	448	0.92	Level	0	0	1.000	1.00	487
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.157 using Equation (Exhibit 13-6)

V_{12} = 1140 pc/h

V_3 or V_{av34} 3063 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2906 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7753	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3393	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.402 (Exibit 13-11)

S_R= 58.7 mph (Exhibit 13-11)

S_0= 64.0 mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6907	
	Ramp Volume, V_R: 283	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6907	0.92	Level	7	0	0.966	1.00	7770
Ramp	283	0.92	Level	0	0	1.000	1.00	308
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.179 using Equation (Exhibit 13-6)

V_{12} = 1393 pc/h

V_3 or V_{av34} 3188 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3108 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8078	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3416	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 27.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.391 (Exibit 13-11)

S_R= 59.1 mph (Exhibit 13-11)

S_0= 63.3 mph (Exhibit 13-11)

S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 6445	
	Ramp Volume, V_R: 822	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6445	0.92	Level	7	0	0.966	1.00	7251
Ramp	822	0.92	Level	0	0	1.000	1.00	893
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 2546 pc/h

V_3 or V_{av34} 2352 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2900 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7251	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6358	Exhibit 13-8	9600	No
V_R	893	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2546	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 17.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.508 (Exhibit 13-12)

S_R = 55.8 mph (Exhibit 13-12)

S_0 = 72.2 mph (Exhibit 13-12)

S = 64.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 5623	
	Ramp Volume, V_R: 899	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5623	0.92	Level	7	0	0.966	1.00	6326
Ramp	899	0.92	Level	0	0	1.000	1.00	977
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.096 using Equation (Exhibit 13-6)

V_{12} = 605 pc/h

V_3 or V_{av34} 2860 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2530 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7303	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3507	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 26.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.388 (Exibit 13-11)

S_R= 59.1 mph (Exhibit 13-11)

S_0= 65.0 mph (Exhibit 13-11)

S = 62.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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QUEUING ANALYSIS WORKSHEETS

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB
Directions Served	T	T	T	T	T	L
Maximum Queue (ft)	84	93	88	218	255	270
Average Queue (ft)	46	62	53	134	199	215
95th Queue (ft)	90	107	97	228	294	307
Link Distance (ft)	1028	1028		328	328	649
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)			210			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB	WB
Directions Served	T	T	L	T
Maximum Queue (ft)	92	113	182	50
Average Queue (ft)	68	90	117	10
95th Queue (ft)	102	126	204	98
Link Distance (ft)	2251	2251		290
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)			360	
Storage Blk Time (%)			0	0
Queuing Penalty (veh)			0	0

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	WB	WB	NB	SB
Directions Served	T	T	R	R
Maximum Queue (ft)	24	41	407	387
Average Queue (ft)	5	18	327	352
95th Queue (ft)	34	51	514	480
Link Distance (ft)	104	104	440	372
Upstream Blk Time (%)			21	75
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB
Directions Served	T	T	T	T	T	L
Maximum Queue (ft)	151	162	68	82	113	247
Average Queue (ft)	89	103	17	42	76	164
95th Queue (ft)	181	192	82	97	128	261
Link Distance (ft)	1028	1028		328	328	649
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			210			
Storage Blk Time (%)		0	0			
Queuing Penalty (veh)		0	0			

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB	WB	WB
Directions Served	T	T	L	T	T
Maximum Queue (ft)	269	300	207	67	28
Average Queue (ft)	216	249	163	20	6
95th Queue (ft)	312	334	228	117	55
Link Distance (ft)	2251	2251		290	290
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			360		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	WB	NB	SB
Directions Served	T	R	R
Maximum Queue (ft)	3	455	387
Average Queue (ft)	1	437	384
95th Queue (ft)	5	506	399
Link Distance (ft)	104	440	372
Upstream Blk Time (%)		63	88
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

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APPENDIX G:

TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

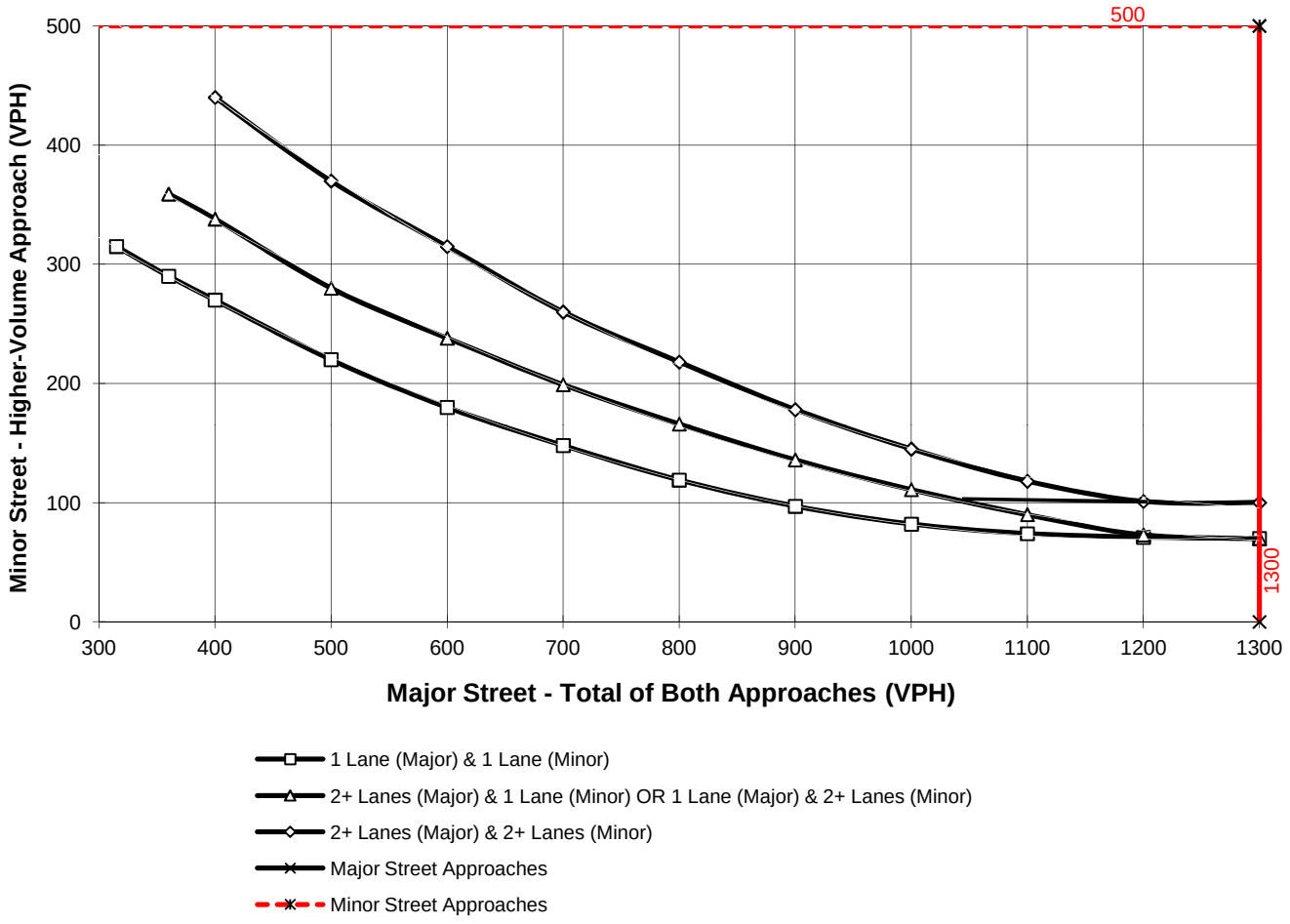
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2016) - Weekday AM Peak Hour**

Major Street Name = **Live Oak Avenue** Total of Both Approaches (VPH) = **1753**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **I-605 NB Off-Ramps** High Volume Approach (VPH) = **661**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

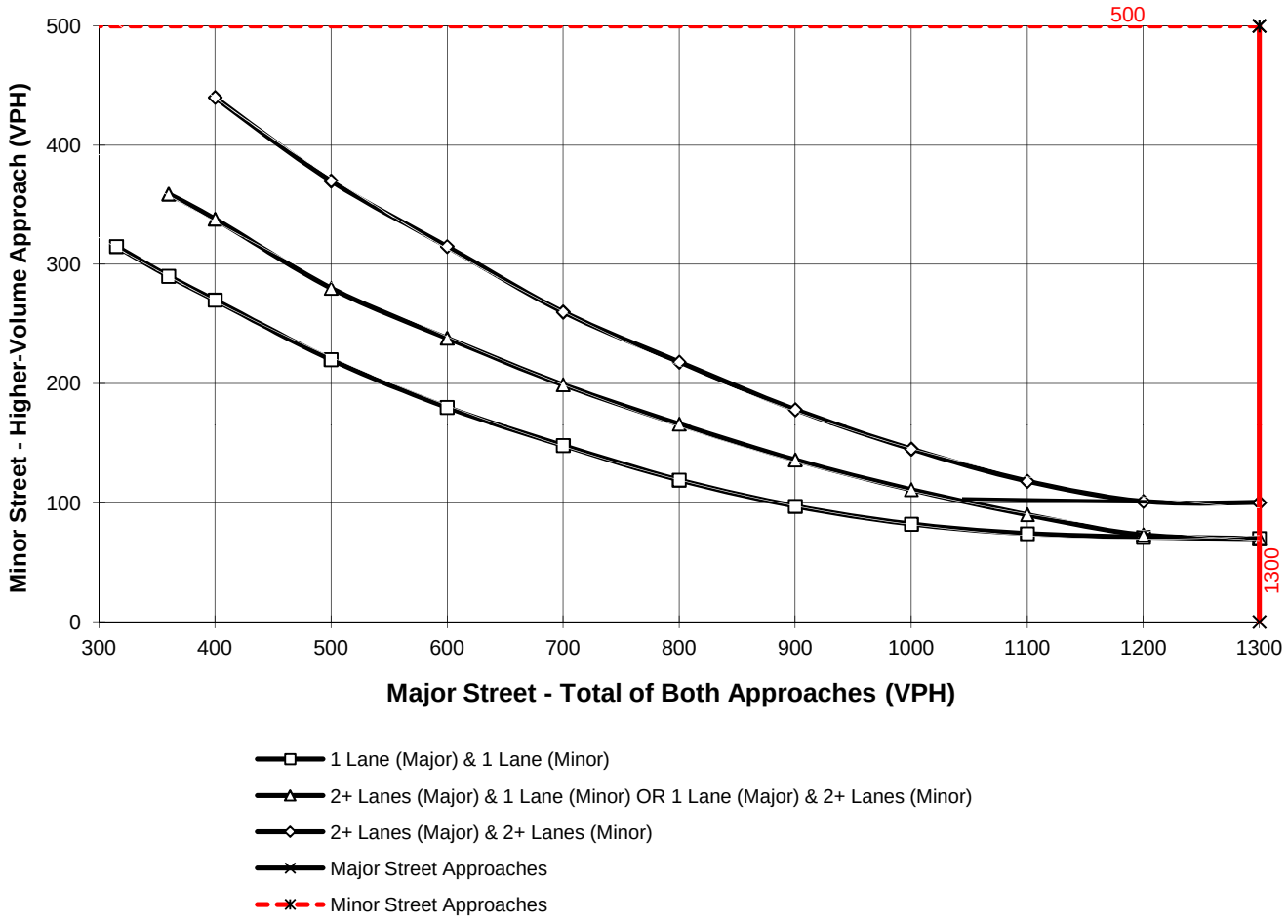
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing - Weekday PM Peak Hour**

Major Street Name = **Live Oak Avenue**
Total of Both Approaches (VPH) = **2494**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **I-605 NB Off-Ramps**
High Volume Approach (VPH) = **681**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

R:\UXRjobs_08100-08500\08517\Signal Warrants\Existing\08_I-605 NB Ramps & Live Oak Av PM.xls\Fig 4C-4 (Rural Peak)

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

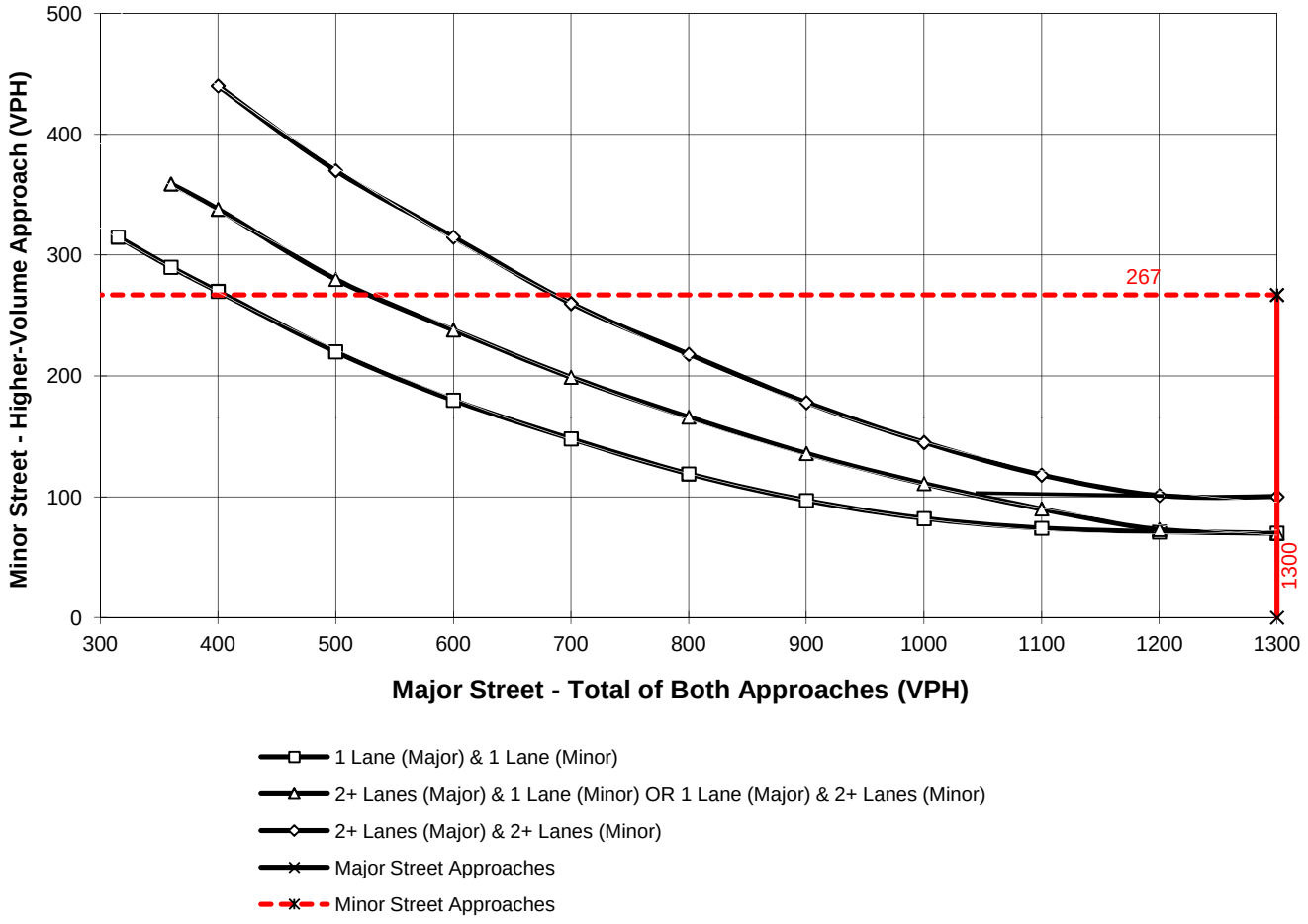
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing + Project Conditions - Weekday AM Peak Hour**

Major Street Name = **Arrow Highway**
Total of Both Approaches (VPH) = **2551**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Driveway 1**
High Volume Approach (VPH) = **267**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

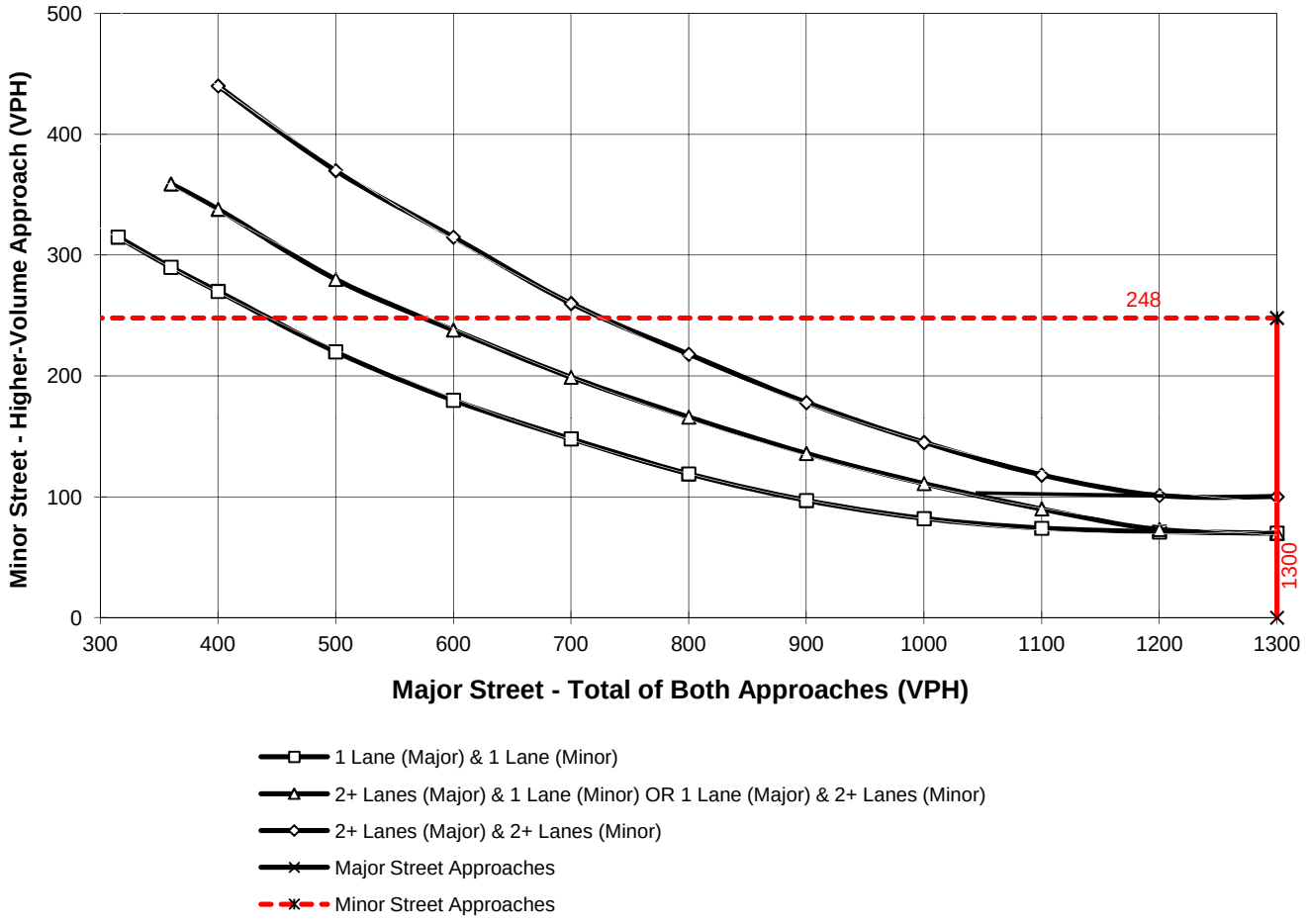
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing + Project Conditions - Weekday PM Peak Hour**

Major Street Name = **Arrow Highway**
Total of Both Approaches (VPH) = **2259**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Driveway 1**
High Volume Approach (VPH) = **248**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



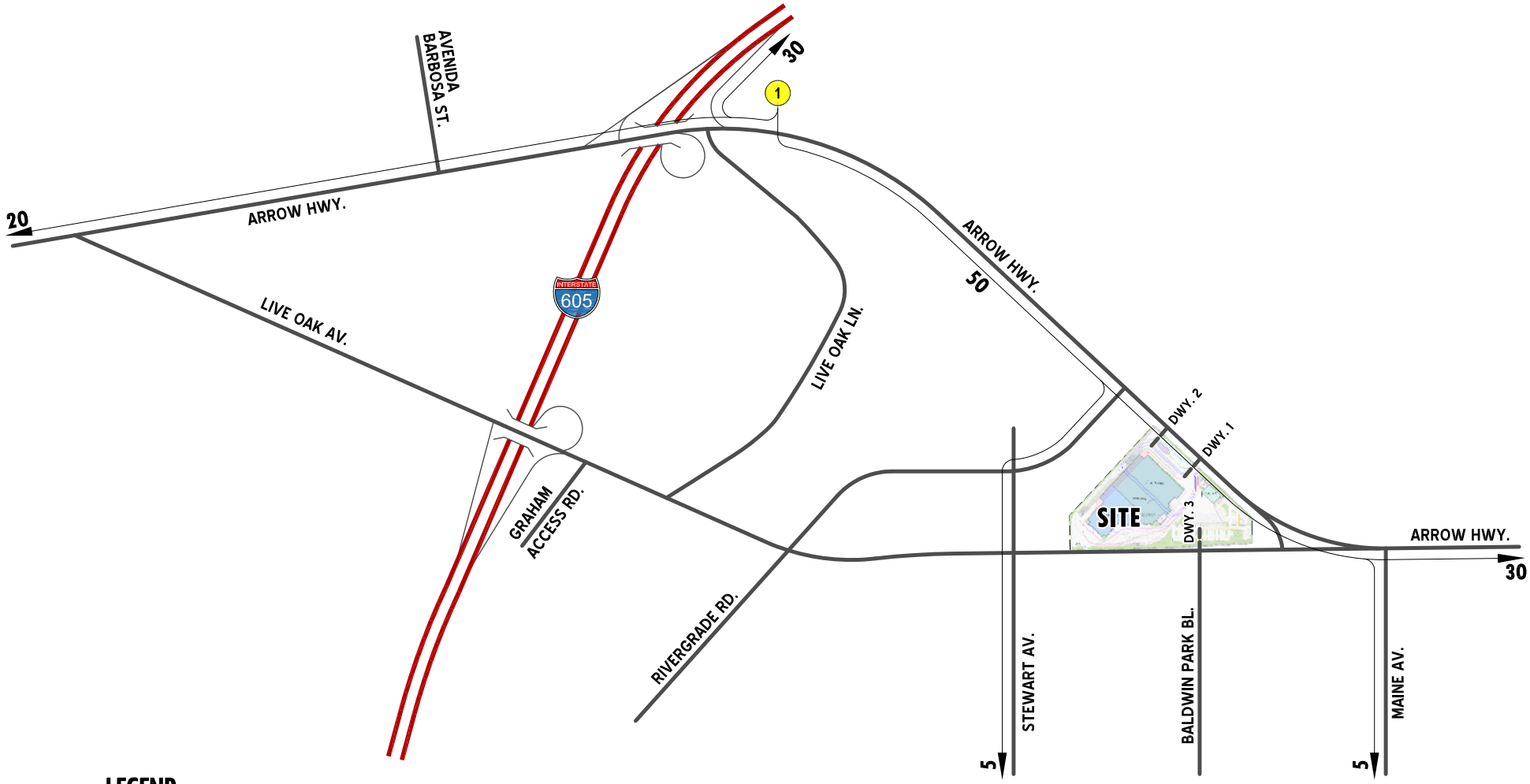
*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX H:

CUMULATIVE PROJECT TRIP DISTRIBUTIONS

EXHIBIT E-1

TAZ 1 TRIP DISTRIBUTION
(KARE YOUTH LEAGUE/SANTA FE DAM SPORTS PARK)



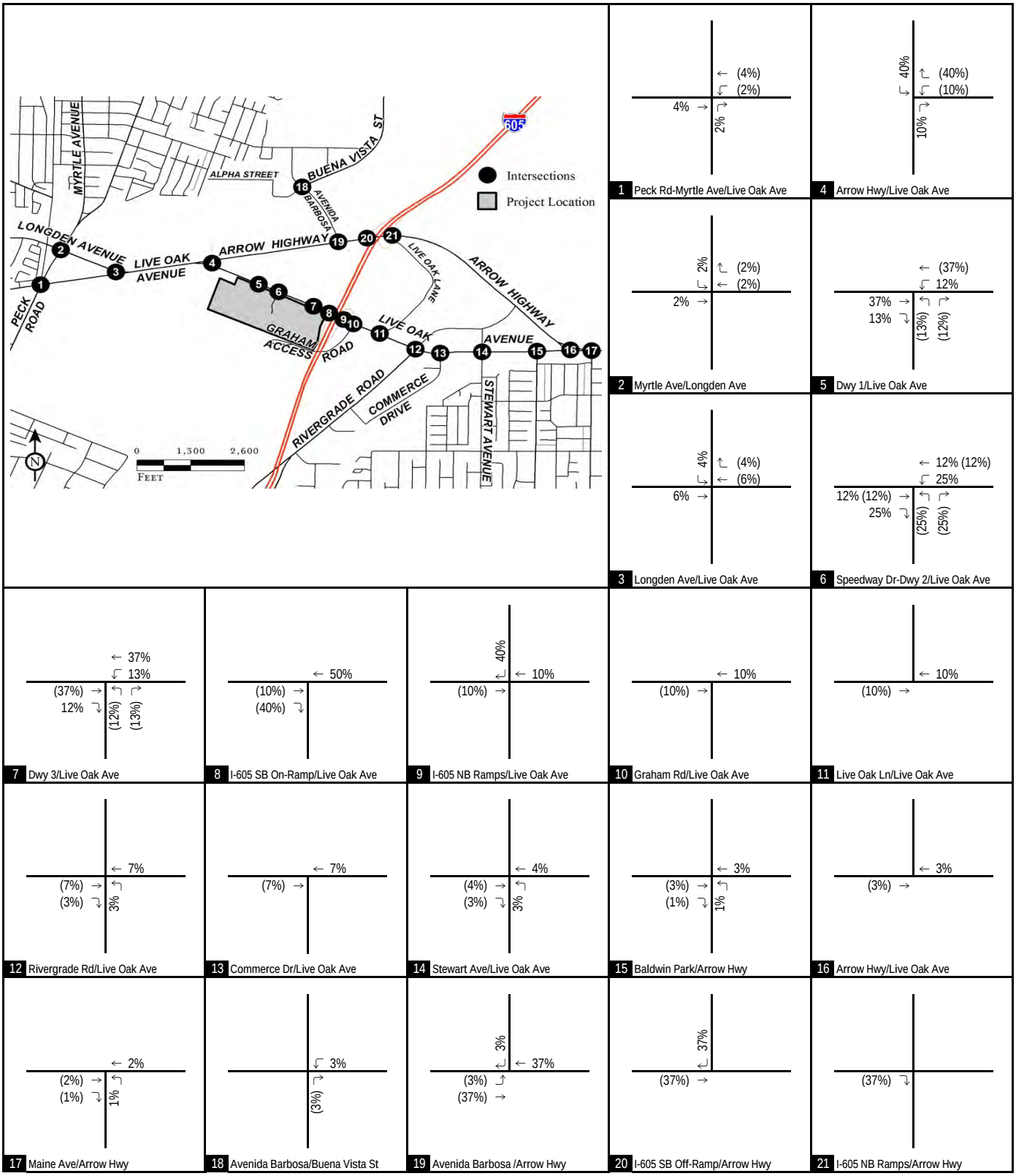
LEGEND:

10 = PERCENT TO/FROM PROJECT

1 = TAZ 1 (KARE YOUTH LEAGUE/SANTA FE DAM SPORTS PARK)

N

H-1



LSA

FIGURE 13

XX% (YY%) Inbound (Outbound) Trip Distribution

Irwindale Regional Shopping Center

Project Trip Distribution

R:\COI1401_Irwindale Outlet Center\Traffic\g30-dist_ (8/27/2014)

EXHIBIT 2-A: Truck Trip Distribution (Outbound)



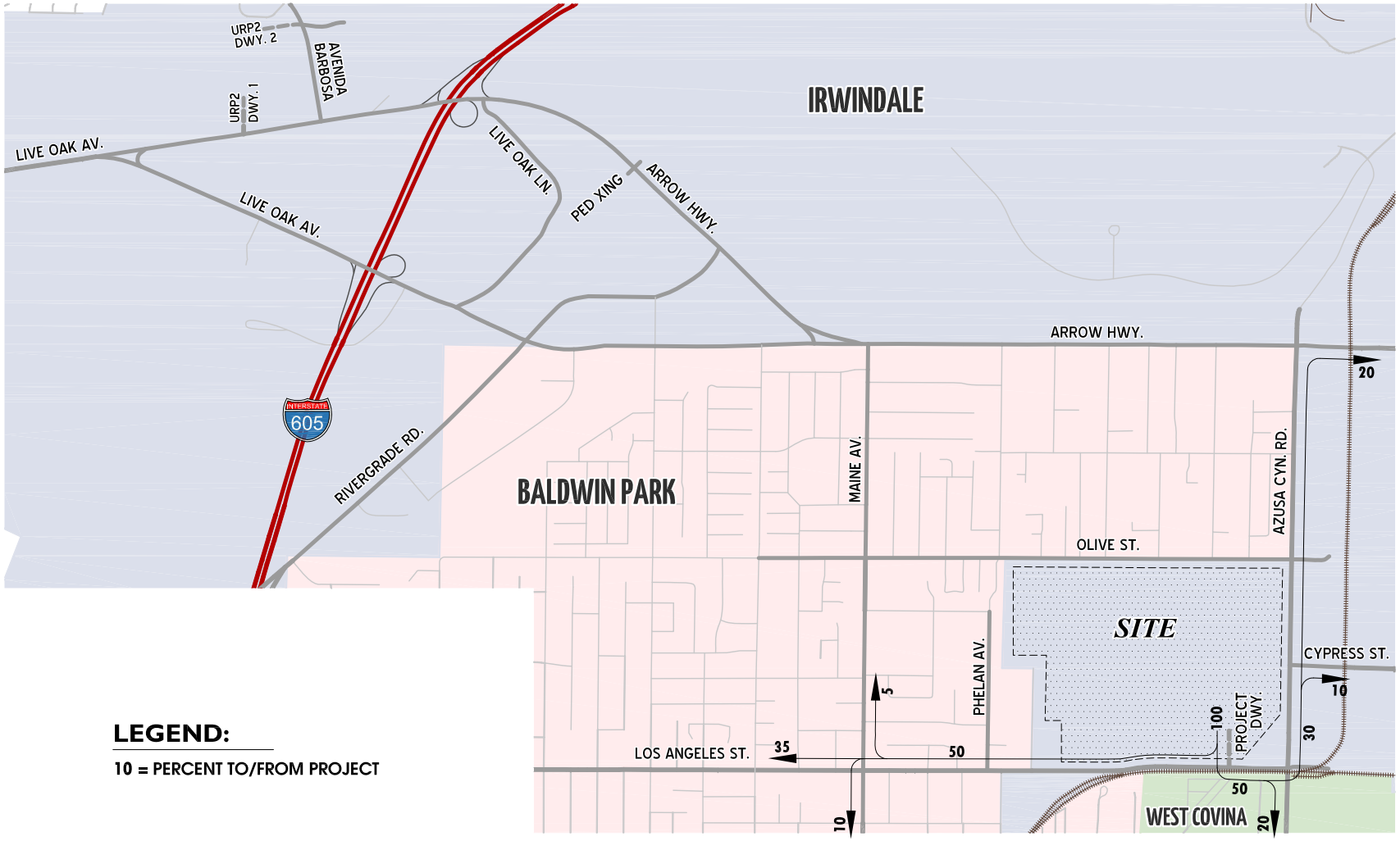
URBAN CROSSROADS

EXHIBIT 2-B: Truck Trip Distribution (Inbound)



URBAN CROSSROADS

EXHIBIT 2-C: Employee (Passenger Car) Trip Distribution



URBAN CROSSROADS

EXHIBIT E-4

TAZ 4 TRIP DISTRIBUTION (MIXED USE)

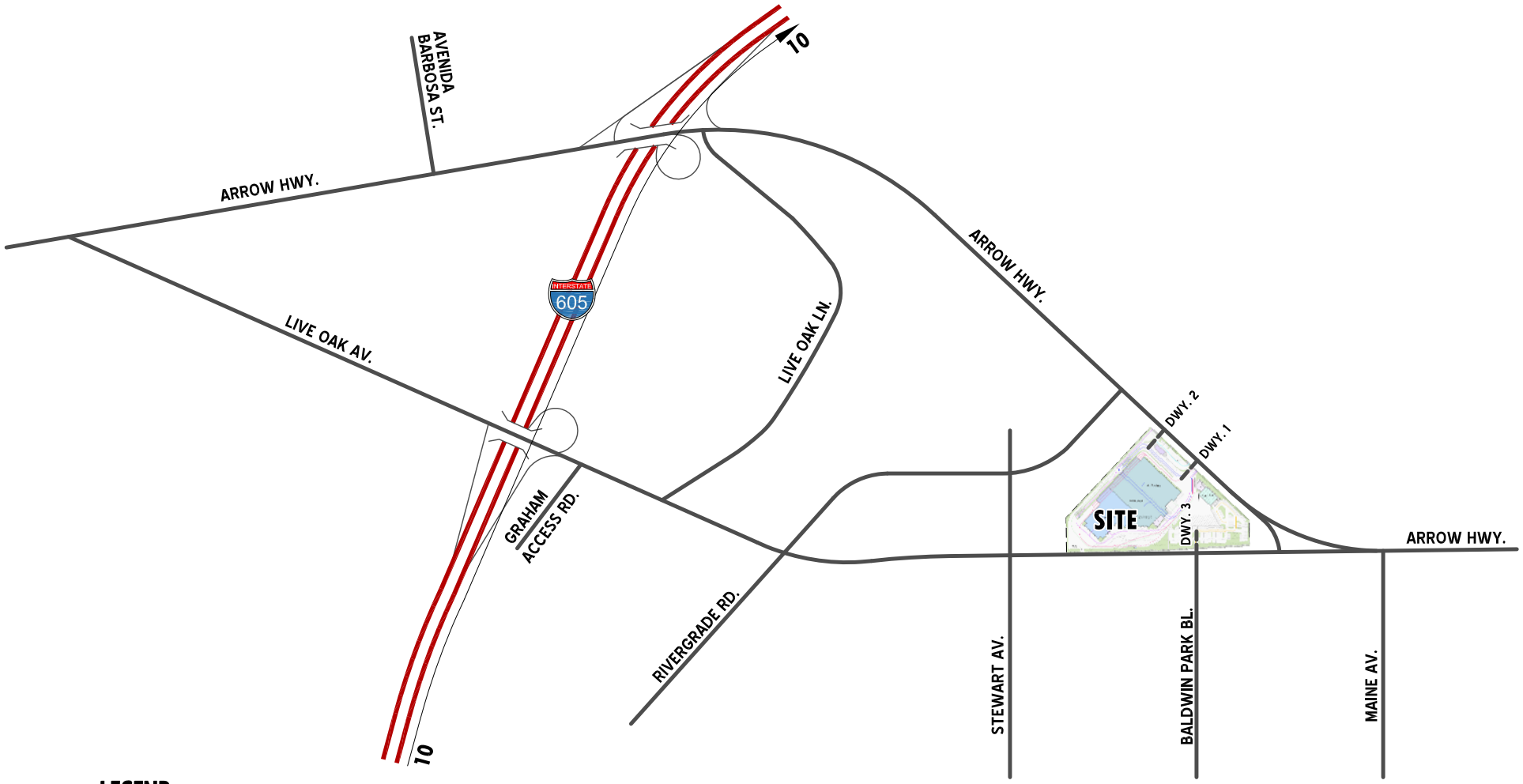
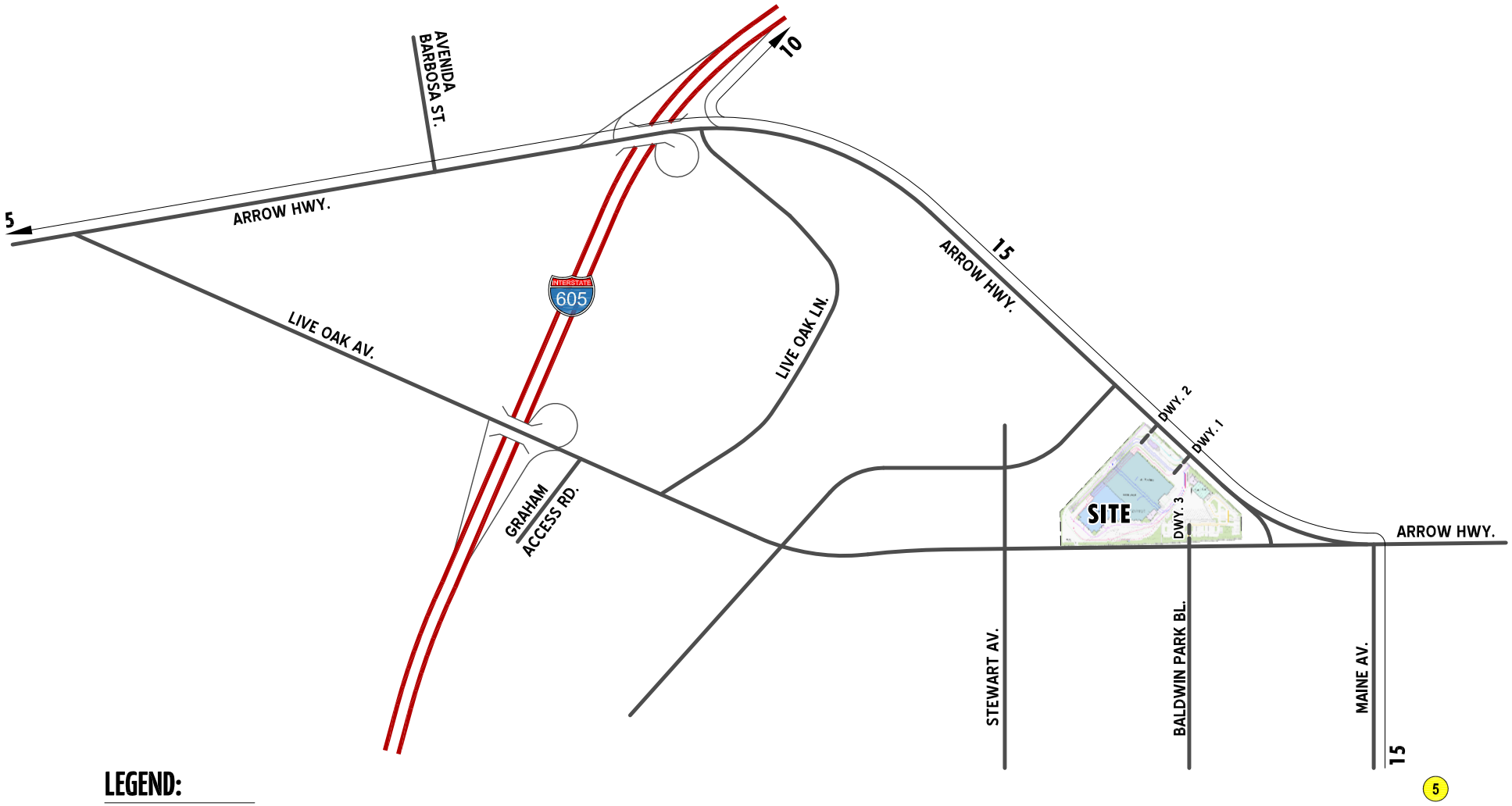


EXHIBIT E-5

TAZ 5 TRIP DISTRIBUTION (MIXED USE)



LEGEND:

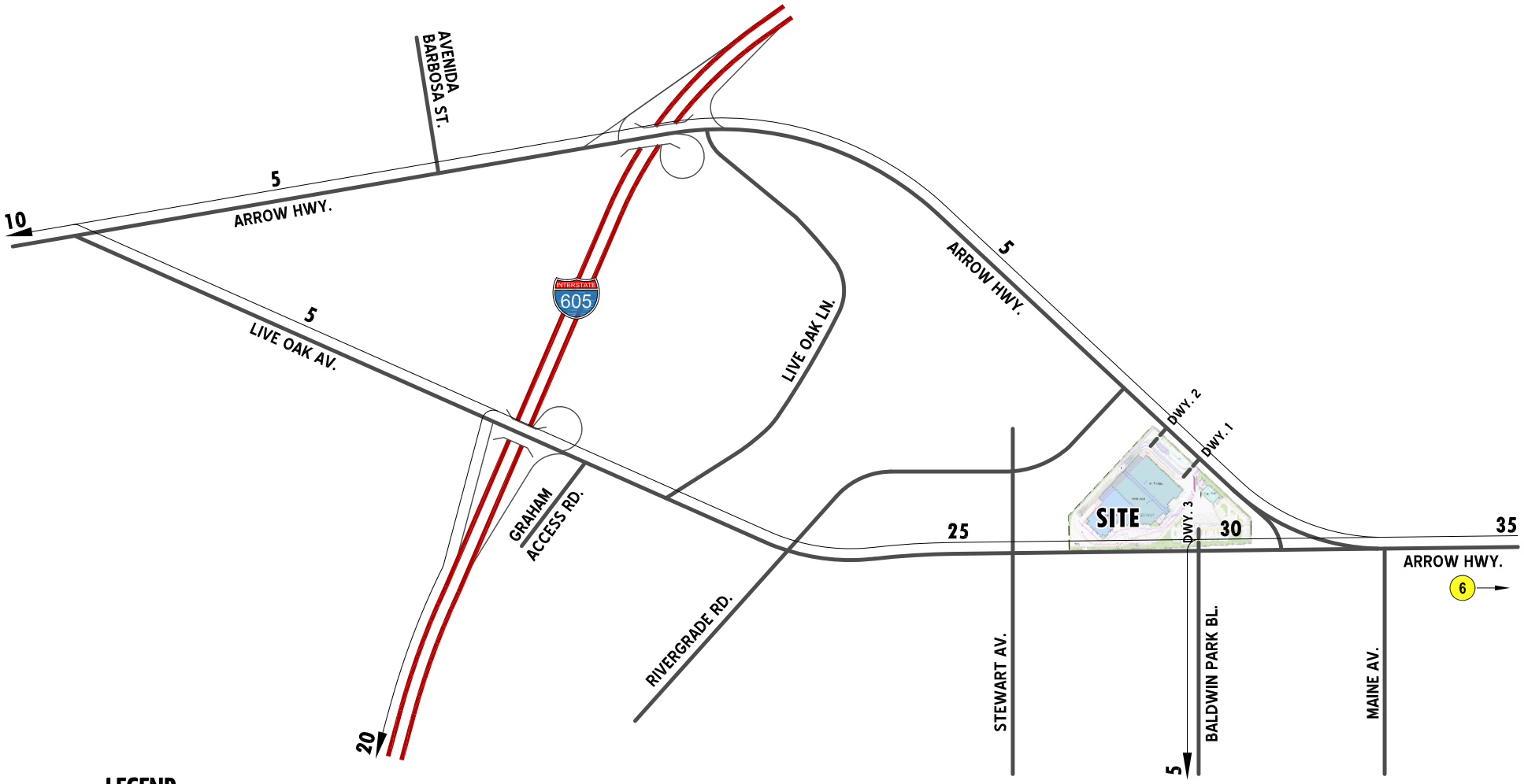
10 = PERCENT TO/FROM PROJECT

(5) = TAZ 5 (MIXED USE)

N

EXHIBIT E-6

TAZ 6 TRIP DISTRIBUTION (MIXED USE)



LEGEND:

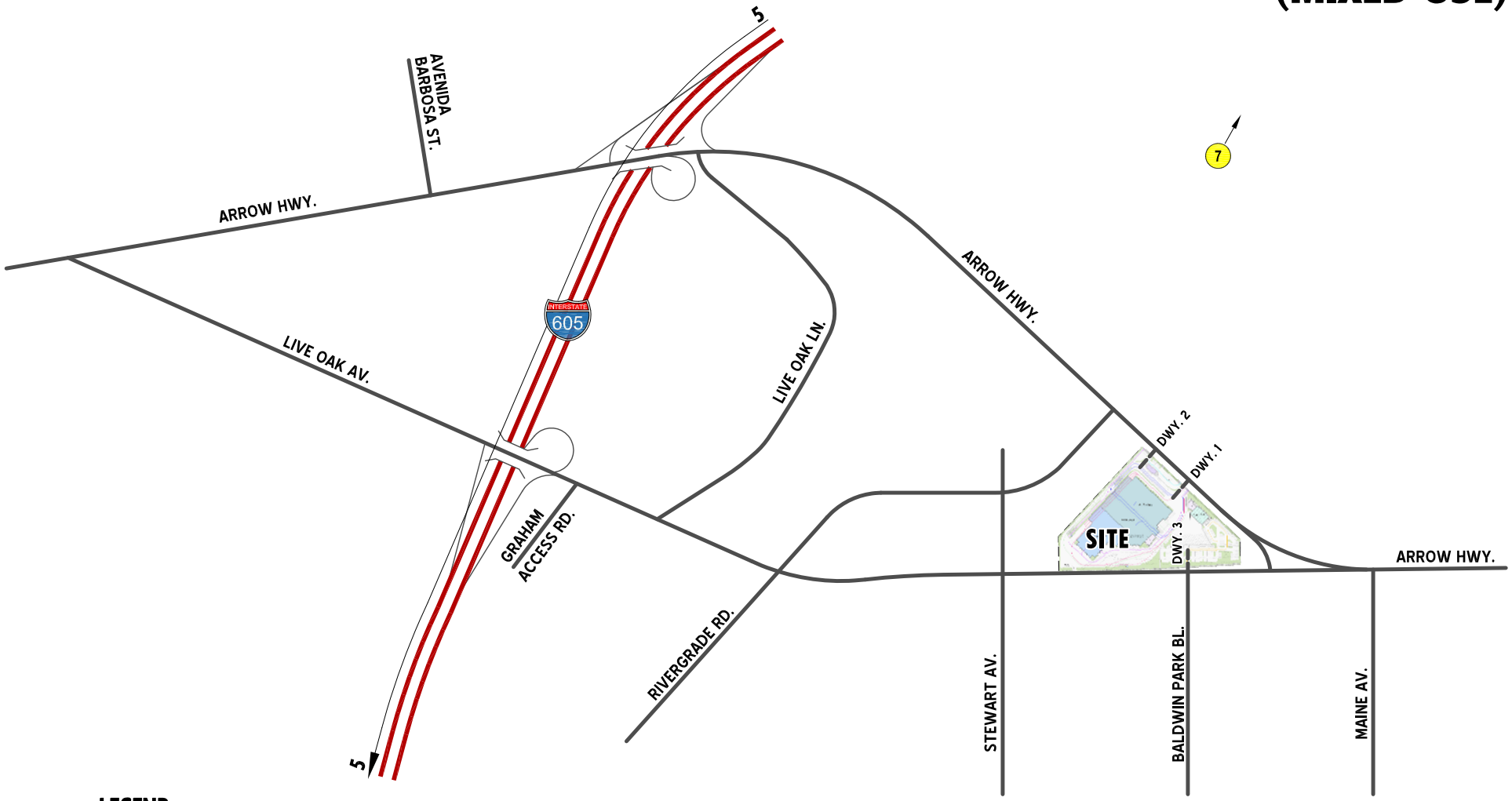
10 = PERCENT TO/FROM PROJECT

6 = TAZ 6 (MIXED USE)

N

EXHIBIT E-7

TAZ 7 TRIP DISTRIBUTION (MIXED USE)



H-9

LEGEND:

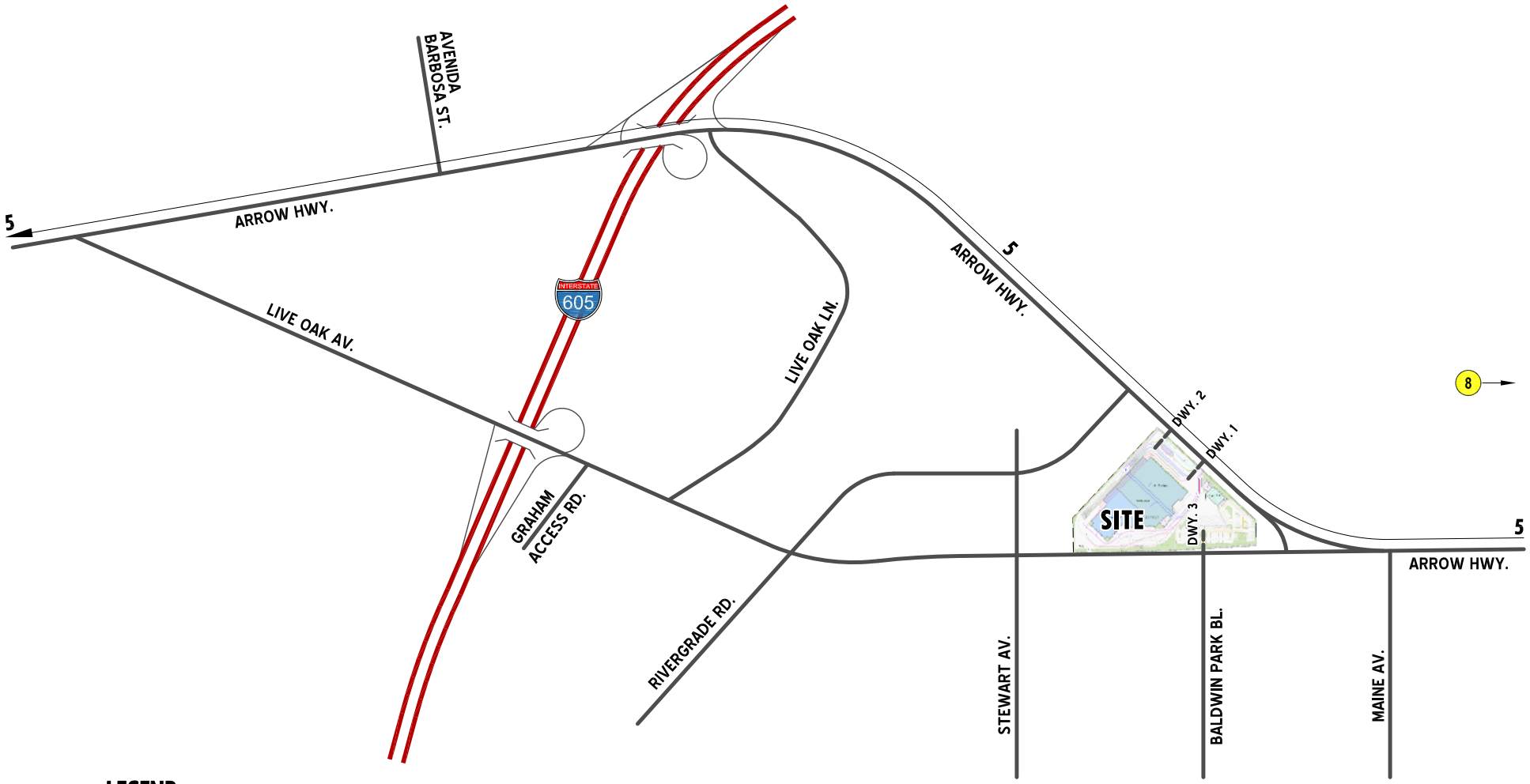
10 = PERCENT TO/FROM PROJECT

7 = TAZ 7 (MIXED USE)

N

EXHIBIT E-8

TAZ 8 TRIP DISTRIBUTION (MIXED USE)



LEGEND:

10 = PERCENT TO/FROM PROJECT

8 = TAZ 8 (MIXED USE)

N

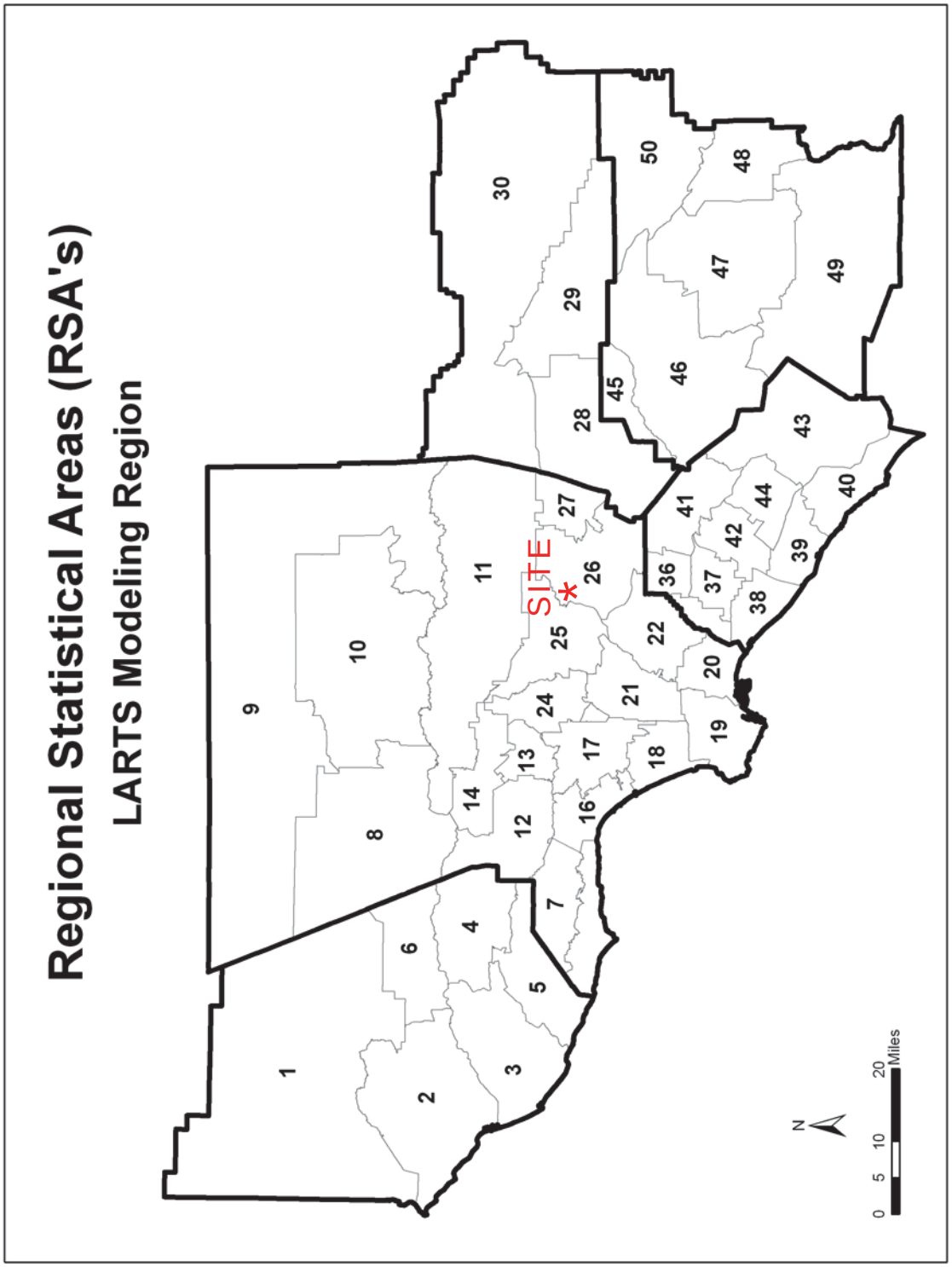
APPENDIX I:

LOS ANGELES CMP GROWTH FACTOR EXCERPTS

Exhibit D-1

GENERAL TRAFFIC VOLUME GROWTH FACTORS

RSA	Representative City/Place	2010	2015	2020	2025	2030	2035
7	Agoura Hills	1.000	1.020	1.041	1.052	1.063	1.075
8	Santa Clarita	1.000	1.145	1.291	1.348	1.405	1.461
9	Lancaster	1.000	1.214	1.427	1.676	1.924	2.172
10	Palmdale	1.000	1.134	1.267	1.363	1.458	1.553
11	Angeles Forest	1.000	1.151	1.301	1.394	1.487	1.580
12	West S.F. Valley	1.000	1.027	1.054	1.068	1.083	1.097
13	Burbank	1.000	1.024	1.049	1.063	1.077	1.092
14	Sylmar	1.000	1.024	1.049	1.071	1.093	1.114
15	Malibu	1.000	1.027	1.054	1.075	1.096	1.117
16	Santa Monica	1.000	1.014	1.028	1.038	1.049	1.059
17	West/Central L.A.	1.000	1.007	1.014	1.024	1.034	1.044
18	South Bay/LAX	1.000	1.013	1.026	1.035	1.044	1.053
19	Palos Verdes	1.000	1.025	1.051	1.061	1.071	1.081
20	Long Beach	1.000	1.076	1.152	1.160	1.168	1.177
21	Vernon	1.000	1.073	1.146	1.158	1.170	1.182
22	Downey	1.000	1.052	1.104	1.116	1.127	1.139
23	Downtown L.A.	1.000	1.009	1.018	1.030	1.042	1.054
24	Glendale	1.000	1.014	1.027	1.041	1.055	1.068
25	Pasadena	1.000	1.041	1.082	1.098	1.115	1.131
26	West Covina	1.000	1.023	1.046	1.066	1.086	1.106
27	Pomona	1.000	1.081	1.161	1.190	1.219	1.248


Regional Statistical Areas (RSA's)
LARTS Modeling Region
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0 5 10 20 Miles

APPENDIX J:

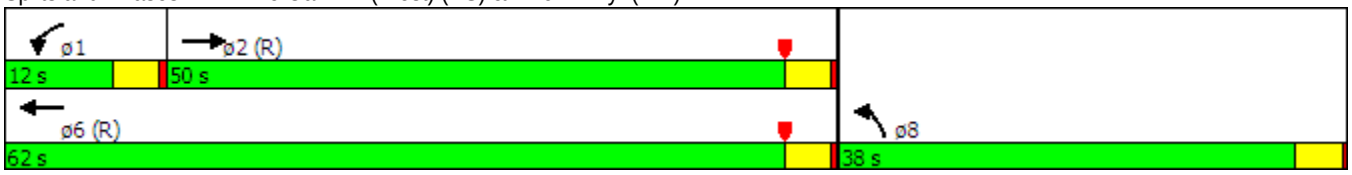
EXISTING PLUS PROJECT CONDITIONS INTERSECTION ANALYSIS WORKSHEETS

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	555	0	120	1653	914	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	50.0		12.0	62.0	38.0	
Total Split (%)	50.0%		12.0%	62.0%	38.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	555	0	120	1653	914	197
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	603	0	130	1797	993	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1859	0	192	2201	1090	501
Arrive On Green	0.51	0.00	0.11	1.00	0.31	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	603	0	130	1797	993	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	9.7	0.0	3.6	0.0	27.2	0.0
Cycle Q Clear(g_c), s	9.7	0.0	3.6	0.0	27.2	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1859	0	192	2201	1090	501
V/C Ratio(X)	0.32	0.00	0.68	0.82	0.91	0.00
Avail Cap(c_a), veh/h	1859	0	281	2201	1194	549
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.1	0.0	43.7	0.0	33.2	0.0
Incr Delay (d2), s/veh	0.5	0.0	2.3	3.5	10.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	5.0	0.0	1.8	1.1	14.6	0.0
LnGrp Delay(d),s/veh	14.6	0.0	46.0	3.5	43.1	0.0
LnGrp LOS	B		D	A	D	
Approach Vol, veh/h	603			1927	993	
Approach Delay, s/veh	14.6			6.4	43.1	
Approach LOS	B			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.5	55.5				65.0		35.0
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	8.0	46.0				58.0		34.0
Max Q Clear Time (g_c+I1), s	5.6	11.7				2.0		29.2
Green Ext Time (p_c), s	0.0	31.6				49.3		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B

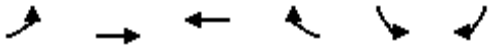
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	288	455	1648	644	121	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	18.0	69.5	51.5	51.5	30.5	30.5
Total Split (%)	18.0%	69.5%	51.5%	51.5%	30.5%	30.5%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	288	455	1648	644	121	122
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	313	495	1791	700	132	133
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	271	2844	2194	981	377	173
Arrive On Green	0.30	1.00	1.00	1.00	0.11	0.11
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	313	495	1791	700	132	133
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	15.0	0.0	0.0	0.0	3.5	8.0
Cycle Q Clear(g_c), s	15.0	0.0	0.0	0.0	3.5	8.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	271	2844	2194	981	377	173
V/C Ratio(X)	1.15	0.17	0.82	0.71	0.35	0.77
Avail Cap(c_a), veh/h	271	2844	2194	981	913	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.51	0.51	1.00	1.00
Uniform Delay (d), s/veh	35.0	0.0	0.0	0.0	41.4	43.4
Incr Delay (d2), s/veh	102.5	0.1	1.8	2.3	0.6	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	15.1	0.1	0.6	0.6	1.7	7.3
LnGrp Delay(d),s/veh	137.5	0.1	1.8	2.3	42.0	50.4
LnGrp LOS	F	A	A	A	D	D
Approach Vol, veh/h		808	2491		265	
Approach Delay, s/veh		53.3	2.0		46.2	
Approach LOS		D	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		84.8		15.2	18.0	66.8		
Change Period (Y+Rc), s		6.0		4.5	3.0	6.0		
Max Green Setting (Gmax), s		63.5		26.0	15.0	45.5		
Max Q Clear Time (g_c+I1), s		2.0		10.0	17.0	2.0		
Green Ext Time (p_c), s		57.6		0.7	0.0	41.5		

Intersection Summary	
HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B

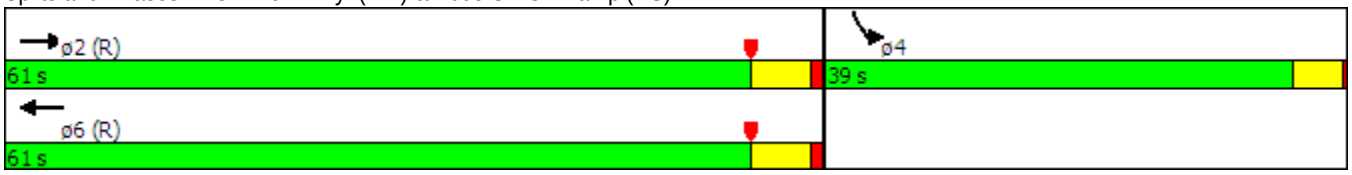
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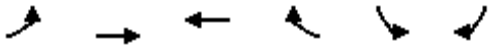
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	576	1776	0	538	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		61.0	61.0		39.0	
Total Split (%)		61.0%	61.0%		39.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

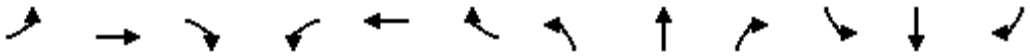




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	576	1776	0	538	515
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	613	1889	0	572	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	2961	2061	0	603	538
Arrive On Green	0.00	1.00	0.57	0.00	0.33	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	613	1889	0	572	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	47.1	0.0	30.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	47.1	0.0	30.8	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	2961	2061	0	603	538
V/C Ratio(X)	0.00	0.21	0.92	0.00	0.95	0.00
Avail Cap(c_a), veh/h	0	2961	2061	0	632	564
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	19.3	0.0	32.5	0.0
Incr Delay (d2), s/veh	0.0	0.2	7.9	0.0	23.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.0	25.6	0.0	19.3	0.0
LnGrp Delay(d),s/veh	0.0	0.2	27.2	0.0	55.9	0.0
LnGrp LOS		A	C		E	
Approach Vol, veh/h		613	1889		572	
Approach Delay, s/veh		0.2	27.2		55.9	
Approach LOS		A	C		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		62.6		37.4		62.6		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		55.5		34.9		55.5		
Max Q Clear Time (g_c+I1), s		2.0		32.8		49.1		
Green Ext Time (p_c), s		53.0		0.5		6.4		

Intersection Summary	
HCM 2010 Ctrl Delay	27.2
HCM 2010 LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			
Volume (vph)	0	789	29	0	1776	458	0	0	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	789	29	0	1776	458	0	0	30	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	822	30	0	1850	477	0	0	31	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1850	0	0	822	0	0	1747	2672	411
Stage 1	-	-	-	-	-	-	822	822	-
Stage 2	-	-	-	-	-	-	925	1850	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	332	-	-	816	-	0	79	23	596
Stage 1	-	-	-	-	-	0	397	391	-
Stage 2	-	-	-	-	-	0	351	126	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	332	-	-	816	-	-	79	0	596
Mov Cap-2 Maneuver	-	-	-	-	-	-	79	0	-
Stage 1	-	-	-	-	-	-	397	0	-
Stage 2	-	-	-	-	-	-	351	0	-

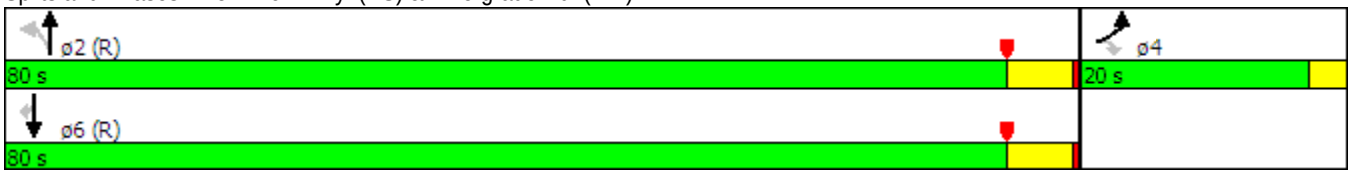
Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	596	332	-	-	816	-
HCM Lane V/C Ratio	0.052	-	-	-	-	-
HCM Control Delay (s)	11.4	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	233	112	131	2042	577	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			350	1292	
Travel Time (s)	15.2			5.3	19.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	20.0	20.0	80.0	80.0	80.0	80.0
Total Split (%)	20.0%	20.0%	80.0%	80.0%	80.0%	80.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	233	112	131	2042	577	298
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	253	122	142	2220	627	324
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	356	164	536	2937	2937	1314
Arrive On Green	0.10	0.10	1.00	1.00	0.81	0.81
Sat Flow, veh/h	3510	1615	599	3705	3705	1615
Grp Volume(v), veh/h	253	122	142	2220	627	324
Grp Sat Flow(s),veh/h/ln	1755	1615	599	1805	1805	1615
Q Serve(g_s), s	7.0	7.3	1.6	0.0	3.9	4.7
Cycle Q Clear(g_c), s	7.0	7.3	5.5	0.0	3.9	4.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	356	164	536	2937	2937	1314
V/C Ratio(X)	0.71	0.75	0.26	0.76	0.21	0.25
Avail Cap(c_a), veh/h	597	275	536	2937	2937	1314
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	43.7	0.1	0.0	2.1	2.2
Incr Delay (d2), s/veh	2.5	6.2	1.2	1.9	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.5	3.6	0.4	0.8	2.0	2.2
LnGrp Delay(d),s/veh	46.0	49.9	1.3	1.9	2.3	2.6
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	375			2362	951	
Approach Delay, s/veh	47.2			1.8	2.4	
Approach LOS	D			A	A	

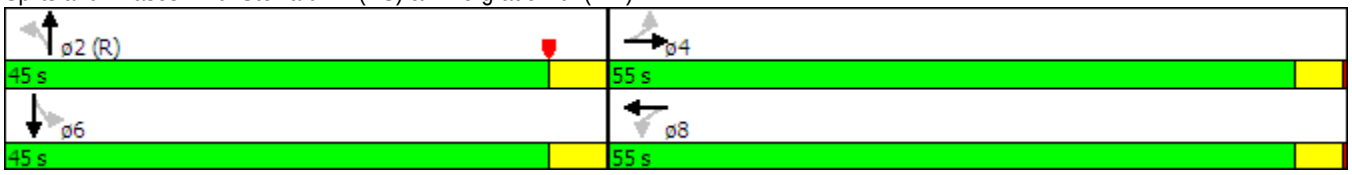
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		86.9		13.1		86.9		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		74.5		17.0		74.5		
Max Q Clear Time (g_c+I1), s		7.5		9.3		6.7		
Green Ext Time (p_c), s		46.2		0.8		46.6		

Intersection Summary	
HCM 2010 Ctrl Delay	6.6
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	211	10	94	369	12	10	9	90	8	6	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	55.0	55.0		55.0	55.0		45.0	45.0		45.0	45.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		45.0%	45.0%		45.0%	45.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	211	10	94	369	12	10	9	90	8	6	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	26	237	11	106	415	13	11	10	101	9	7	16
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	737	34	247	749	23	1069	104	1051	333	268	555
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.71	0.71	0.71	0.71	0.71	0.71
Sat Flow, veh/h	975	3514	162	1150	3574	112	1410	147	1490	407	380	787
Grp Volume(v), veh/h	26	121	127	106	209	219	11	0	111	32	0	0
Grp Sat Flow(s),veh/h/ln	975	1805	1871	1150	1805	1880	1410	0	1637	1574	0	0
Q Serve(g_s), s	2.5	5.7	5.7	8.6	10.4	10.4	0.0	0.0	2.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	12.9	5.7	5.7	14.4	10.4	10.4	0.2	0.0	2.1	0.6	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.06	1.00		0.91	0.28		0.50
Lane Grp Cap(c), veh/h	175	378	392	247	378	394	1069	0	1155	1157	0	0
V/C Ratio(X)	0.15	0.32	0.32	0.43	0.55	0.55	0.01	0.00	0.10	0.03	0.00	0.00
Avail Cap(c_a), veh/h	468	921	954	592	921	959	1069	0	1155	1157	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.98	0.98	0.98	0.63	0.00	0.63	1.00	0.00	0.00
Uniform Delay (d), s/veh	41.1	33.5	33.5	39.6	35.3	35.3	4.4	0.0	4.7	4.4	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.4	0.4	1.2	1.2	1.2	0.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	2.9	3.0	2.8	5.3	5.5	0.1	0.0	1.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	41.4	33.9	33.9	40.7	36.6	36.5	4.4	0.0	4.8	4.5	0.0	0.0
LnGrp LOS	D	C	C	D	D	D	A		A	A		
Approach Vol, veh/h		274			534			122			32	
Approach Delay, s/veh		34.6			37.4			4.7			4.5	
Approach LOS		C			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		75.0		25.0		75.0		25.0
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		40.5		51.0		40.5		51.0
Max Q Clear Time (g_c+I1), s		4.1		14.9		2.6		16.4
Green Ext Time (p_c), s		0.5		4.6		0.6		4.6

Intersection Summary	
HCM 2010 Ctrl Delay	31.4
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	316	611	799	1355	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	26.0		74.0	100.0		
Total Split (%)	26.0%		74.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



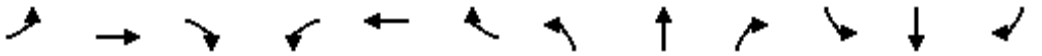
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	316	611	799	1355	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	336	0	850	1441		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.94	0.94	0.94	0.94		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	859	384	1238	3531		
Arrive On Green	0.24	0.00	1.00	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	336	0	850	1441		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	7.8	0.0	0.0	0.0		
Cycle Q Clear(g_c), s	7.8	0.0	0.0	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	859	384	1238	3531		
V/C Ratio(X)	0.39	0.00	0.69	0.41		
Avail Cap(c_a), veh/h	859	384	1238	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	32.0	0.0	0.0	0.0		
Incr Delay (d2), s/veh	1.3	0.0	3.1	0.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	4.0	0.0	1.1	0.2		
LnGrp Delay(d),s/veh	33.4	0.0	3.1	0.4		
LnGrp LOS	C		A	A		
Approach Vol, veh/h	336			2291		
Approach Delay, s/veh	33.4			1.4		
Approach LOS	C			A		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	74.0	29.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	68.4	* 21				94.4		
Max Q Clear Time (g_c+I1), s	2.0	9.8				2.0		
Green Ext Time (p_c), s	10.5	9.5				48.5		

Intersection Summary	
HCM 2010 Ctrl Delay	5.5
HCM 2010 LOS	A

Notes

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	316	0	0	1558	0	0	0	783	0	0	596
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	87.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	316	0	0	1558	0	0	0	783	0	0	596
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	326	0	0	1606	0	0	0	807	0	0	614

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1606	0	0	326	0	0	1129	1932	163	1769	1932	803
Stage 1	-	-	-	-	-	-	326	326	-	1606	1606	-
Stage 2	-	-	-	-	-	-	803	1606	-	163	326	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	412	-	-	1245	-	-	161	67	859	54	67	~ 331
Stage 1	-	-	-	-	-	-	666	652	-	112	166	-
Stage 2	-	-	-	-	-	-	348	166	-	829	652	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	412	-	-	1245	-	-	-	67	859	3	67	~ 331
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	67	-	3	67	-
Stage 1	-	-	-	-	-	-	666	652	-	112	166	-
Stage 2	-	-	-	-	-	-	-	166	-	50	652	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	39.9	$ 423.5
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	859	412	-	-	1245	-	-	331
HCM Lane V/C Ratio	0.94	-	-	-	-	-	-	1.856
HCM Control Delay (s)	39.9	0	-	-	0	-	-	$ 423.5
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	14.5	0	-	-	0	-	-	41

Notes

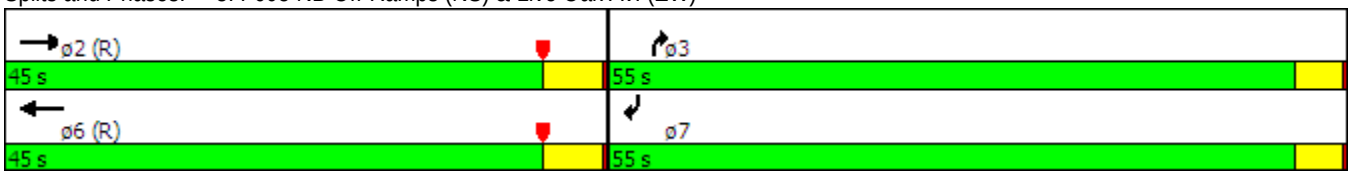
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	316	0	0	1558	0	0	0	783	0	0	596
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Detector Phase		2			6				3			7
Switch Phase												
Minimum Initial (s)		10.0			10.0				4.0			4.0
Minimum Split (s)		21.0			21.0				8.0			8.0
Total Split (s)		45.0			45.0				55.0			55.0
Total Split (%)		45.0%			45.0%				55.0%			55.0%
Yellow Time (s)		4.5			4.5				3.5			3.5
All-Red Time (s)		0.5			0.5				0.5			0.5
Lost Time Adjust (s)		0.0			0.0				0.0			0.0
Total Lost Time (s)		5.0			5.0				4.0			4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max				None			None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 75 (75%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	316	0	0	1558	0	0	0	783	0	0	596
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	0	0	1900	0	0	0	1900	0	0	1900
Adj Flow Rate, veh/h	0	326	0	0	1606	0	0	0	807	0	0	614
Adj No. of Lanes	0	2	0	0	3	0	0	0	2	0	0	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	3430	0	0	4928	0	0	0	0	0	0	0
Arrive On Green	0.00	0.31	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	3800	0	0	5529	0		0			0	
Grp Volume(v), veh/h	0	326	0	0	1606	0		0.0			0.0	
Grp Sat Flow(s),veh/h/ln	0	1805	0	0	1729	0						
Q Serve(g_s), s	0.0	6.4	0.0	0.0	0.0	0.0						
Cycle Q Clear(g_c), s	0.0	6.4	0.0	0.0	0.0	0.0						
Prop In Lane	0.00		0.00	0.00		0.00						
Lane Grp Cap(c), veh/h	0	3430	0	0	4928	0						
V/C Ratio(X)	0.00	0.10	0.00	0.00	0.33	0.00						
Avail Cap(c_a), veh/h	0	3430	0	0	4928	0						
HCM Platoon Ratio	1.00	0.33	1.00	1.00	2.00	1.00						
Upstream Filter(I)	0.00	0.89	0.00	0.00	0.79	0.00						
Uniform Delay (d), s/veh	0.0	3.9	0.0	0.0	0.0	0.0						
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.1	0.0						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(-26165%),veh/ln	0.0	3.2	0.0	0.0	0.1	0.0						
LnGrp Delay(d),s/veh	0.0	4.0	0.0	0.0	0.1	0.0						
LnGrp LOS		A			A							
Approach Vol, veh/h		326			1606							
Approach Delay, s/veh		4.0			0.1							
Approach LOS		A			A							

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		
Phs Duration (G+Y+Rc), s		100.0				100.0		
Change Period (Y+Rc), s		5.0				5.0		
Max Green Setting (Gmax), s		40.0				40.0		
Max Q Clear Time (g_c+I1), s		8.4				2.0		
Green Ext Time (p_c), s		24.1				27.7		

Intersection Summary	
HCM 2010 Ctrl Delay	0.8
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	996	103	46	1410	148	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	60.0	60.0	11.0	71.0	29.0	
Total Split (%)	60.0%	60.0%	11.0%	71.0%	29.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



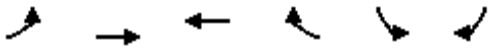
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	996	103	46	1410	148	56
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	1083	112	50	1533	161	61
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2565	1148	65	2802	188	71
Arrive On Green	0.48	0.48	0.02	0.52	0.15	0.15
Sat Flow, veh/h	3705	1615	1810	3705	1265	479
Grp Volume(v), veh/h	1083	112	50	1533	223	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1752	0
Q Serve(g_s), s	19.7	3.8	2.7	28.5	12.4	0.0
Cycle Q Clear(g_c), s	19.7	3.8	2.7	28.5	12.4	0.0
Prop In Lane		1.00	1.00		0.72	0.27
Lane Grp Cap(c), veh/h	2565	1148	65	2802	261	0
V/C Ratio(X)	0.42	0.10	0.77	0.55	0.86	0.00
Avail Cap(c_a), veh/h	2565	1148	145	2802	456	0
HCM Platoon Ratio	0.67	0.67	0.67	0.67	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.7	8.6	48.4	12.2	41.5	0.0
Incr Delay (d2), s/veh	0.5	0.2	7.2	0.8	7.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	10.0	1.7	1.5	14.5	6.6	0.0
LnGrp Delay(d),s/veh	13.2	8.7	55.6	13.0	49.4	0.0
LnGrp LOS	B	A	E	B	D	
Approach Vol, veh/h	1195			1583	223	
Approach Delay, s/veh	12.8			14.3	49.4	
Approach LOS	B			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.6	75.6				82.1		17.9
Change Period (Y+Rc), s	3.0	4.5				4.5		3.0
Max Green Setting (Gmax), s	8.0	55.5				66.5		26.0
Max Q Clear Time (g_c+I1), s	4.7	21.7				30.5		14.4
Green Ext Time (p_c), s	0.0	30.0				31.8		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Notes

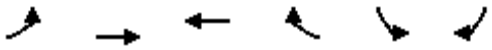
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	83	973	1346	53	13	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	83	973	1346	53	13	128
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	87	1024	1417	56	14	135
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.74				0.83	0.74
vC, conflicting volume	1473				2104	708
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	941				988	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				92	83
cM capacity (veh/h)	547				172	809

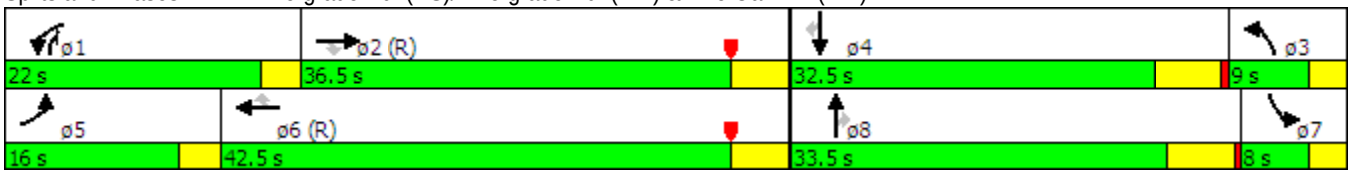
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	87	512	512	708	708	56	148
Volume Left	87	0	0	0	0	0	14
Volume Right	0	0	0	0	0	56	135
cSH	547	1700	1700	1700	1700	1700	603
Volume to Capacity	0.16	0.30	0.30	0.42	0.42	0.03	0.25
Queue Length 95th (ft)	14	0	0	0	0	0	24
Control Delay (s)	12.8	0.0	0.0	0.0	0.0	0.0	12.9
Lane LOS	B						B
Approach Delay (s)	1.0			0.0			12.9
Approach LOS							B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	182	711	84	253	1170	13	40	51	109	29	76	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	16.0	36.5	36.5	22.0	42.5	42.5	9.0	33.5	22.0	8.0	32.5	32.5
Total Split (%)	16.0%	36.5%	36.5%	22.0%	42.5%	42.5%	9.0%	33.5%	22.0%	8.0%	32.5%	32.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	182	711	84	253	1170	13	40	51	109	29	76	174
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	198	773	0	275	1272	14	43	55	118	32	83	189
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	232	1877	840	300	2013	901	55	141	388	144	447	200
Arrive On Green	0.04	0.17	0.00	0.33	1.00	1.00	0.03	0.07	0.07	0.13	0.21	0.21
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	198	773	0	275	1272	14	43	55	118	32	83	189
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	10.9	19.1	0.0	14.6	0.0	0.0	2.4	2.8	4.5	1.6	1.9	8.7
Cycle Q Clear(g_c), s	10.9	19.1	0.0	14.6	0.0	0.0	2.4	2.8	4.5	1.6	1.9	8.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	1877	840	300	2013	901	55	141	388	144	447	200
V/C Ratio(X)	0.85	0.41	0.00	0.92	0.63	0.02	0.78	0.39	0.30	0.22	0.19	0.95
Avail Cap(c_a), veh/h	235	1877	840	344	2013	901	109	532	720	144	975	436
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	0.00	0.52	0.52	0.52	1.00	1.00	1.00	0.73	0.73	0.73
Uniform Delay (d), s/veh	46.9	27.8	0.0	32.7	0.0	0.0	48.2	44.1	17.9	40.6	35.5	22.5
Incr Delay (d2), s/veh	23.6	0.7	0.0	15.3	0.8	0.0	8.6	3.0	0.7	0.2	0.2	22.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	7.0	9.8	0.0	8.5	0.2	0.0	1.3	1.6	2.1	0.8	1.0	5.1
LnGrp Delay(d),s/veh	70.5	28.5	0.0	48.1	0.8	0.0	56.8	47.1	18.6	40.8	35.8	44.8
LnGrp LOS	E	C		D	A	A	E	D	B	D	D	D
Approach Vol, veh/h		971			1561			216			304	
Approach Delay, s/veh		37.0			9.1			33.5			41.9	
Approach LOS		D			A			C			D	

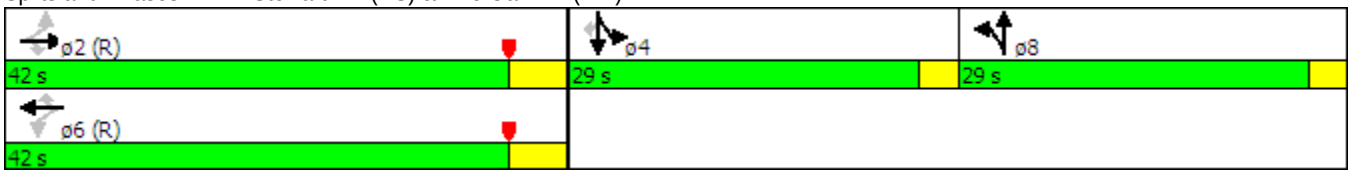
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.6	56.5	6.0	17.9	15.8	60.3	11.0	12.9
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	19.0	32.0	6.0	27.0	13.0	38.0	5.0	28.0
Max Q Clear Time (g_c+I1), s	16.6	21.1	4.4	10.7	12.9	2.0	3.6	6.5
Green Ext Time (p_c), s	0.0	9.5	0.0	1.6	0.0	25.6	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	23.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	661	26	19	1517	38	210	120	37	13	28	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	661	26	19	1517	38	210	120	37	13	28	76
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	21	718	28	21	1649	41	228	130	40	14	30	83
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	168	2108	943	496	2108	943	249	142	44	130	136	116
Arrive On Green	1.00	1.00	1.00	0.78	0.78	0.78	0.24	0.24	0.24	0.07	0.07	0.07
Sat Flow, veh/h	296	3610	1615	726	3610	1615	1040	593	182	1810	1900	1615
Grp Volume(v), veh/h	21	718	28	21	1649	41	398	0	0	14	30	83
Grp Sat Flow(s),veh/h/ln	296	1805	1615	726	1805	1615	1816	0	0	1810	1900	1615
Q Serve(g_s), s	3.6	0.0	0.0	0.7	26.0	0.6	21.4	0.0	0.0	0.7	1.5	5.0
Cycle Q Clear(g_c), s	29.6	0.0	0.0	0.7	26.0	0.6	21.4	0.0	0.0	0.7	1.5	5.0
Prop In Lane	1.00		1.00	1.00		1.00	0.57		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	168	2108	943	496	2108	943	435	0	0	130	136	116
V/C Ratio(X)	0.13	0.34	0.03	0.04	0.78	0.04	0.92	0.00	0.00	0.11	0.22	0.72
Avail Cap(c_a), veh/h	168	2108	943	496	2108	943	472	0	0	470	494	420
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	0.56	0.56	0.56	1.00	0.00	0.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	6.6	0.0	0.0	4.7	7.6	4.7	37.0	0.0	0.0	43.4	43.8	45.4
Incr Delay (d2), s/veh	1.4	0.4	0.1	0.1	1.7	0.0	21.6	0.0	0.0	0.3	0.7	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.4	0.1	0.0	0.1	13.0	0.3	13.3	0.0	0.0	0.4	0.8	2.5
LnGrp Delay(d),s/veh	8.0	0.4	0.1	4.8	9.3	4.8	58.6	0.0	0.0	43.8	44.5	52.6
LnGrp LOS	A	A	A	A	A	A	E			D	D	D
Approach Vol, veh/h		767			1711			398			127	
Approach Delay, s/veh		0.6			9.1			58.6			49.7	
Approach LOS		A			A			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		62.9		10.2		62.9		26.9
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		31.6		7.0		28.0		23.4
Green Ext Time (p_c), s		4.8		0.3		7.1		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	525	63	134	1376	43	296	10	293	12	4	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		50	200		0	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	60			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1141			511			1039			220	
Travel Time (s)		17.3			7.7			23.6			5.0	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Detector Phase	5	2	2	1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	10.0	10.0		4.0	4.0	
Minimum Split (s)	8.0	20.5	20.5	8.0	20.0	20.0	20.5	20.5		8.0	20.0	
Total Split (s)	8.0	40.5	40.5	19.0	51.5	51.5	20.5	32.5		8.0	20.0	
Total Split (%)	8.0%	40.5%	40.5%	19.0%	51.5%	51.5%	20.5%	32.5%		8.0%	20.0%	
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5		3.5	3.5	
All-Red Time (s)	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	43	525	63	134	1376	43	296	10	293	12	4	19
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	47	571	68	146	1496	47	322	11	318	13	4	21
Adj No. of Lanes	1	2	1	1	2	1	2	1	0	1	1	0
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	60	1591	712	176	1822	815	562	15	439	22	34	177
Arrive On Green	0.07	0.88	0.88	0.19	1.00	1.00	0.16	0.28	0.28	0.01	0.13	0.13
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	3510	54	1569	1810	265	1390
Grp Volume(v), veh/h	47	571	68	146	1496	47	322	0	329	13	0	25
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1755	0	1623	1810	0	1655
Q Serve(g_s), s	2.6	2.7	0.5	7.7	0.0	0.0	8.5	0.0	18.3	0.7	0.0	1.3
Cycle Q Clear(g_c), s	2.6	2.7	0.5	7.7	0.0	0.0	8.5	0.0	18.3	0.7	0.0	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.84
Lane Grp Cap(c), veh/h	60	1591	712	176	1822	815	562	0	454	22	0	210
V/C Ratio(X)	0.78	0.36	0.10	0.83	0.82	0.06	0.57	0.00	0.72	0.59	0.00	0.12
Avail Cap(c_a), veh/h	72	1591	712	271	1822	815	562	0	454	72	0	265
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.83	0.83	0.83	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.3	3.5	3.4	39.5	0.0	0.0	38.8	0.0	32.5	49.1	0.0	38.7
Incr Delay (d2), s/veh	34.0	0.6	0.3	10.1	3.6	0.1	4.2	0.0	9.6	22.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.8	1.4	0.3	4.3	0.9	0.0	4.4	0.0	9.4	0.5	0.0	0.6
LnGrp Delay(d),s/veh	80.3	4.1	3.6	49.6	3.6	0.1	43.1	0.0	42.1	72.1	0.0	38.9
LnGrp LOS	F	A	A	D	A	A	D		D	E		D
Approach Vol, veh/h		686			1689			651			38	
Approach Delay, s/veh		9.3			7.5			42.6			50.3	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	48.6	20.5	17.2	7.3	55.0	5.2	32.5
Change Period (Y+Rc), s	4.0	4.5	4.5	* 4.5	4.0	4.5	4.0	4.5
Max Green Setting (Gmax), s	15.0	36.0	16.0	* 16	4.0	47.0	4.0	28.0
Max Q Clear Time (g_c+I1), s	9.7	4.7	10.5	3.3	4.6	2.0	2.7	20.3
Green Ext Time (p_c), s	0.1	26.0	0.9	2.7	0.0	34.9	0.0	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B

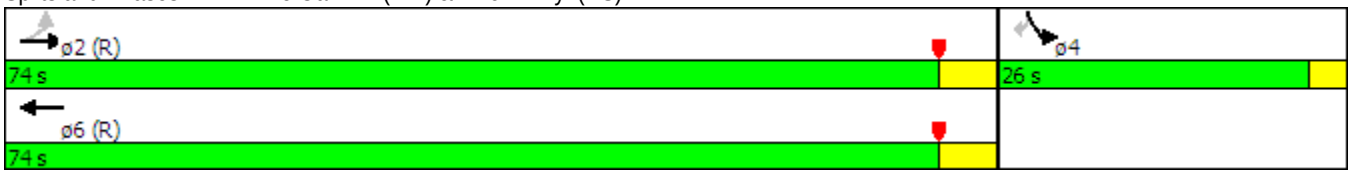
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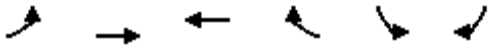
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	109	721	1456	0	369	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	14.5	14.5	14.5		26.0	26.0
Total Split (s)	74.0	74.0	74.0		26.0	26.0
Total Split (%)	74.0%	74.0%	74.0%		26.0%	26.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 36 (36%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	109	721	1456	0	369	97
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	112	743	1501	0	380	100
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	298	2844	2844	0	482	222
Arrive On Green	1.00	1.00	0.79	0.00	0.14	0.14
Sat Flow, veh/h	355	3705	3800	0	3510	1615
Grp Volume(v), veh/h	112	743	1501	0	380	100
Grp Sat Flow(s),veh/h/ln	355	1805	1805	0	1755	1615
Q Serve(g_s), s	10.1	0.0	15.1	0.0	10.5	5.7
Cycle Q Clear(g_c), s	25.2	0.0	15.1	0.0	10.5	5.7
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	298	2844	2844	0	482	222
V/C Ratio(X)	0.38	0.26	0.53	0.00	0.79	0.45
Avail Cap(c_a), veh/h	298	2844	2844	0	807	371
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	2.4	0.0	3.9	0.0	41.7	39.7
Incr Delay (d2), s/veh	3.3	0.2	0.7	0.0	2.9	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.2	0.1	7.6	0.0	5.3	2.6
LnGrp Delay(d),s/veh	5.7	0.2	4.6	0.0	44.7	41.1
LnGrp LOS	A	A	A		D	D
Approach Vol, veh/h		855	1501		480	
Approach Delay, s/veh		0.9	4.6		43.9	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		83.3		16.7		83.3		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		69.5		23.0		69.5		
Max Q Clear Time (g_c+I1), s		27.2		12.5		17.1		
Green Ext Time (p_c), s		36.5		1.2		43.8		

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	795	111	34	2656	619	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	70.0	70.0	70.0	70.0	30.0	30.0
Total Split (%)	70.0%	70.0%	70.0%	70.0%	30.0%	30.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	795	111	34	2656	619	104
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	864	121	37	2887	673	113
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2346	1050	385	3372	913	420
Arrive On Green	0.65	0.65	0.65	0.65	0.26	0.26
Sat Flow, veh/h	3705	1615	580	5358	3510	1615
Grp Volume(v), veh/h	864	121	37	2887	673	113
Grp Sat Flow(s),veh/h/ln	1805	1615	580	1729	1755	1615
Q Serve(g_s), s	11.0	2.8	3.1	43.9	17.6	5.6
Cycle Q Clear(g_c), s	11.0	2.8	14.1	43.9	17.6	5.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2347	1050	385	3372	913	420
V/C Ratio(X)	0.37	0.12	0.10	0.86	0.74	0.27
Avail Cap(c_a), veh/h	2347	1050	385	3372	913	420
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.1	6.6	11.3	13.8	33.9	29.4
Incr Delay (d2), s/veh	0.4	0.2	0.5	3.0	5.3	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	5.5	1.3	0.6	21.5	9.2	2.7
LnGrp Delay(d),s/veh	8.5	6.8	11.8	16.9	39.2	31.0
LnGrp LOS	A	A	B	B	D	C
Approach Vol, veh/h	985			2924	786	
Approach Delay, s/veh	8.3			16.8	38.0	
Approach LOS	A			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		70.0				70.0		30.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		65.0				65.0		26.0
Max Q Clear Time (g_c+I1), s		13.0				45.9		19.6
Green Ext Time (p_c), s		51.4				19.0		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	18.6
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	255	12	10	1917	454	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			100
Storage Lanes	1	1	1			0
Taper Length (ft)	25		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			45	45	
Link Distance (ft)	296			257	167	
Travel Time (s)	6.7			3.9	2.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	28.0	28.0	8.0	72.0	64.0	64.0
Total Split (%)	28.0%	28.0%	8.0%	72.0%	64.0%	64.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 16: Arrow Hwy. (NS) & Driveway 1 (EW)





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	255	12	10	1917	454	170
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	268	13	11	2018	478	179
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	307	274	19	2710	2527	1131
Arrive On Green	0.17	0.17	0.01	0.75	1.00	1.00
Sat Flow, veh/h	1810	1615	1810	3705	3705	1615
Grp Volume(v), veh/h	268	13	11	2018	478	179
Grp Sat Flow(s),veh/h/ln	1810	1615	1810	1805	1805	1615
Q Serve(g_s), s	14.4	0.7	0.6	31.6	0.0	0.0
Cycle Q Clear(g_c), s	14.4	0.7	0.6	31.6	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	307	274	19	2710	2527	1131
V/C Ratio(X)	0.87	0.05	0.58	0.74	0.19	0.16
Avail Cap(c_a), veh/h	434	388	72	2710	2527	1131
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.5	34.8	49.3	7.1	0.0	0.0
Incr Delay (d2), s/veh	13.2	0.1	24.7	1.9	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	8.3	0.7	0.4	16.1	0.1	0.1
LnGrp Delay(d),s/veh	53.7	34.8	73.9	9.0	0.2	0.3
LnGrp LOS	D	C	E	A	A	A
Approach Vol, veh/h	281			2029	657	
Approach Delay, s/veh	52.9			9.3	0.2	
Approach LOS	D			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		79.1		20.9	5.1	74.0		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		68.0		24.0	4.0	60.0		
Max Q Clear Time (g_c+I1), s		33.6		16.4	2.6	2.0		
Green Ext Time (p_c), s		26.1		0.5	0.0	37.8		

Intersection Summary	
HCM 2010 Ctrl Delay	11.4
HCM 2010 LOS	B



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	5	2	4	2168	622	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Link Speed (mph)	30			45	45	
Link Distance (ft)	301			157	350	
Travel Time (s)	6.8			2.4	5.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	5	2	4	2168	622	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	2	4	2282	655	69

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1804	327	655	0	-	0
Stage 1	655	-	-	-	-	-
Stage 2	1149	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	72	675	942	-	-	-
Stage 1	484	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	72	675	942	-	-	-
Mov Cap-2 Maneuver	187	-	-	-	-	-
Stage 1	484	-	-	-	-	-
Stage 2	268	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	942	-	236	-	-
HCM Lane V/C Ratio	0.004	-	0.031	-	-
HCM Control Delay (s)	8.8	0	20.7	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	878	0	237	904	824	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	44.0		16.0	60.0	40.0	
Total Split (%)	44.0%		16.0%	60.0%	40.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	878	0	237	904	824	117
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	954	0	258	983	896	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1801	0	322	2277	1015	467
Arrive On Green	0.50	0.00	0.18	1.00	0.29	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	954	0	258	983	896	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	18.0	0.0	7.0	0.0	24.4	0.0
Cycle Q Clear(g_c), s	18.0	0.0	7.0	0.0	24.4	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1801	0	322	2277	1015	467
V/C Ratio(X)	0.53	0.00	0.80	0.43	0.88	0.00
Avail Cap(c_a), veh/h	1801	0	421	2277	1264	581
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.1	0.0	39.9	0.0	33.9	0.0
Incr Delay (d2), s/veh	1.1	0.0	6.6	0.6	6.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	9.2	0.0	3.7	0.2	12.7	0.0
LnGrp Delay(d),s/veh	18.2	0.0	46.5	0.6	40.4	0.0
LnGrp LOS	B		D	A	D	
Approach Vol, veh/h	954			1241	896	
Approach Delay, s/veh	18.2			10.1	40.4	
Approach LOS	B			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.2	53.9				67.1		32.9
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	12.0	40.0				56.0		36.0
Max Q Clear Time (g_c+I1), s	9.0	20.0				2.0		26.4
Green Ext Time (p_c), s	0.2	17.3				38.9		2.6

Intersection Summary	
HCM 2010 Ctrl Delay	21.4
HCM 2010 LOS	C

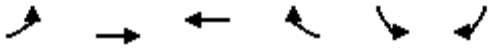
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	188	805	836	199	362	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	23.0	68.0	45.0	45.0	32.0	32.0
Total Split (%)	23.0%	68.0%	45.0%	45.0%	32.0%	32.0%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	188	805	836	199	362	310
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	204	875	909	216	393	337
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	233	2382	1809	809	826	380
Arrive On Green	0.26	1.00	1.00	1.00	0.24	0.24
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	204	875	909	216	393	337
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	10.8	0.0	0.0	0.0	9.6	20.2
Cycle Q Clear(g_c), s	10.8	0.0	0.0	0.0	9.6	20.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	233	2382	1809	809	826	380
V/C Ratio(X)	0.88	0.37	0.50	0.27	0.48	0.89
Avail Cap(c_a), veh/h	362	2382	1809	809	965	444
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.96	0.96	1.00	1.00
Uniform Delay (d), s/veh	36.4	0.0	0.0	0.0	32.9	37.0
Incr Delay (d2), s/veh	9.3	0.4	1.0	0.8	0.4	17.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	5.9	0.1	0.2	0.2	4.7	18.2
LnGrp Delay(d),s/veh	45.7	0.4	1.0	0.8	33.4	54.2
LnGrp LOS	D	A	A	A	C	D
Approach Vol, veh/h		1079	1125		730	
Approach Delay, s/veh		9.0	0.9		43.0	
Approach LOS		A	A		D	

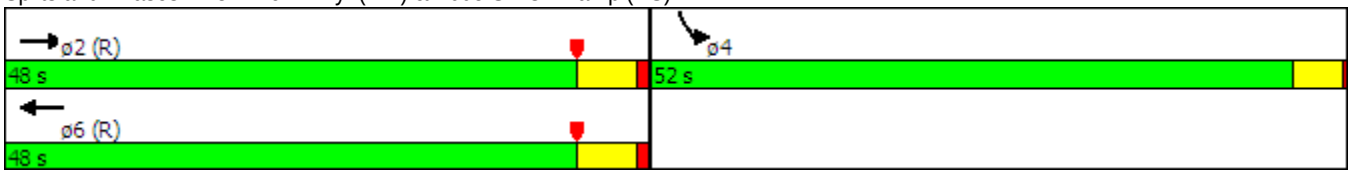
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		72.0		28.0	15.9	56.1		
Change Period (Y+Rc), s		6.0		4.5	3.0	6.0		
Max Green Setting (Gmax), s		62.0		27.5	20.0	39.0		
Max Q Clear Time (g_c+I1), s		2.0		22.2	12.8	2.0		
Green Ext Time (p_c), s		41.5		1.4	0.1	29.0		

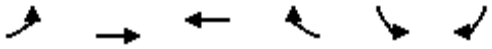
Intersection Summary	
HCM 2010 Ctrl Delay	14.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	1167	729	0	420	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		48.0	48.0		52.0	
Total Split (%)		48.0%	48.0%		52.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

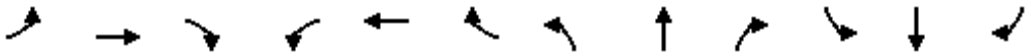




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	1167	729	0	420	306
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	1268	792	0	457	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	3246	2259	0	503	449
Arrive On Green	0.00	1.00	0.63	0.00	0.28	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	1268	792	0	457	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	10.5	0.0	24.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	10.5	0.0	24.4	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	3246	2259	0	503	449
V/C Ratio(X)	0.00	0.39	0.35	0.00	0.91	0.00
Avail Cap(c_a), veh/h	0	3246	2259	0	867	774
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.90	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	9.0	0.0	34.9	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.4	0.0	7.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.0	0.1	5.3	0.0	13.3	0.0
LnGrp Delay(d),s/veh	0.0	0.3	9.4	0.0	42.5	0.0
LnGrp LOS		A	A		D	
Approach Vol, veh/h		1268	792		457	
Approach Delay, s/veh		0.3	9.4		42.5	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		68.1		31.9		68.1		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		42.5		47.9		42.5		
Max Q Clear Time (g_c+I1), s		2.0		26.4		12.5		
Green Ext Time (p_c), s		39.1		1.4		29.2		

Intersection Summary	
HCM 2010 Ctrl Delay	10.8
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1464	15	0	729	463	0	0	32	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1464	15	0	729	463	0	0	32	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1557	16	0	776	493	0	0	34	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	776	0	0	1557	0	0	1945	2333	779
Stage 1	-	-	-	-	-	-	1557	1557	-
Stage 2	-	-	-	-	-	-	388	776	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	849	-	-	431	-	0	58	37	343
Stage 1	-	-	-	-	-	0	162	175	-
Stage 2	-	-	-	-	-	0	661	410	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	849	-	-	431	-	-	58	0	343
Mov Cap-2 Maneuver	-	-	-	-	-	-	58	0	-
Stage 1	-	-	-	-	-	-	162	0	-
Stage 2	-	-	-	-	-	-	661	0	-

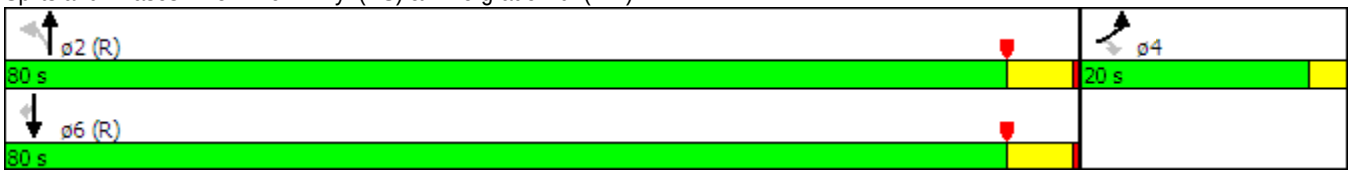
Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	343	849	-	-	431	-
HCM Lane V/C Ratio	0.099	-	-	-	-	-
HCM Control Delay (s)	16.6	0	-	-	0	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	160	138	127	1008	1245	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			350	1292	
Travel Time (s)	15.2			5.3	19.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	20.0	20.0	80.0	80.0	80.0	80.0
Total Split (%)	20.0%	20.0%	80.0%	80.0%	80.0%	80.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 5 (5%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	160	138	127	1008	1245	141
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	167	144	132	1050	1297	147
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	394	181	332	2898	2898	1296
Arrive On Green	0.11	0.11	1.00	1.00	0.80	0.80
Sat Flow, veh/h	3510	1615	375	3705	3705	1615
Grp Volume(v), veh/h	167	144	132	1050	1297	147
Grp Sat Flow(s),veh/h/ln	1755	1615	375	1805	1805	1615
Q Serve(g_s), s	4.4	8.7	8.6	0.0	11.1	2.0
Cycle Q Clear(g_c), s	4.4	8.7	19.7	0.0	11.1	2.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	394	181	332	2898	2898	1296
V/C Ratio(X)	0.42	0.79	0.40	0.36	0.45	0.11
Avail Cap(c_a), veh/h	597	275	332	2898	2898	1296
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.4	43.3	1.4	0.0	3.0	2.1
Incr Delay (d2), s/veh	0.7	8.7	3.5	0.4	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	2.2	4.3	1.2	0.1	5.6	0.9
LnGrp Delay(d),s/veh	42.1	51.9	4.9	0.4	3.5	2.3
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	311			1182	1444	
Approach Delay, s/veh	46.6			0.9	3.4	
Approach LOS	D			A	A	

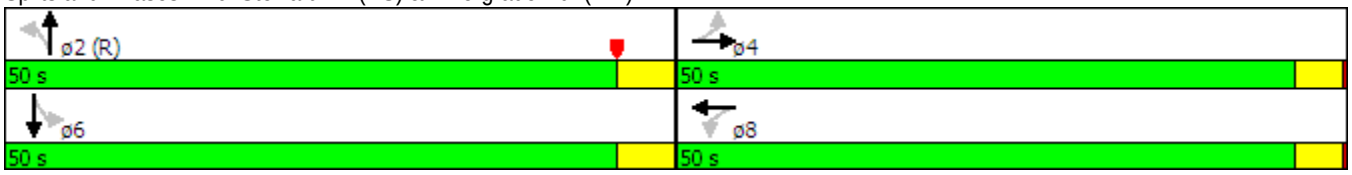
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		85.8		14.2		85.8		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		74.5		17.0		74.5		
Max Q Clear Time (g_c+I1), s		21.7		10.7		13.1		
Green Ext Time (p_c), s		35.8		0.5		39.5		

Intersection Summary	
HCM 2010 Ctrl Delay	7.0
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	250	38	298	172	4	1	2	74	5	21	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	50.0	50.0		50.0	50.0		50.0	50.0		50.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	250	38	298	172	4	1	2	74	5	21	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	3	325	49	387	223	5	1	3	96	6	27	19
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	564	1438	215	475	1647	37	713	23	722	102	441	290
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	1171	3151	471	1024	3610	81	1381	49	1573	135	962	632
Grp Volume(v), veh/h	3	185	189	387	111	117	1	0	99	52	0	0
Grp Sat Flow(s),veh/h/ln	1171	1805	1817	1024	1805	1886	1381	0	1622	1729	0	0
Q Serve(g_s), s	0.1	6.2	6.3	36.8	3.6	3.6	0.0	0.0	3.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.7	6.2	6.3	43.2	3.6	3.6	0.0	0.0	3.5	1.6	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.04	1.00		0.97	0.12		0.37
Lane Grp Cap(c), veh/h	564	824	829	475	824	861	713	0	744	833	0	0
V/C Ratio(X)	0.01	0.22	0.23	0.82	0.14	0.14	0.00	0.00	0.13	0.06	0.00	0.00
Avail Cap(c_a), veh/h	569	830	836	479	830	867	713	0	744	833	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.97	0.97	0.97	0.92	0.00	0.92	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.8	16.5	16.5	29.6	15.7	15.8	14.7	0.0	15.6	15.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	10.2	0.1	0.1	0.0	0.0	0.3	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.0	3.1	3.2	11.7	1.8	1.9	0.0	0.0	1.6	0.8	0.0	0.0
LnGrp Delay(d),s/veh	16.8	16.6	16.6	39.7	15.8	15.8	14.7	0.0	15.9	15.2	0.0	0.0
LnGrp LOS	B	B	B	D	B	B	B		B	B		
Approach Vol, veh/h		377			615			100			52	
Approach Delay, s/veh		16.6			30.9			15.9			15.2	
Approach LOS		B			C			B			B	

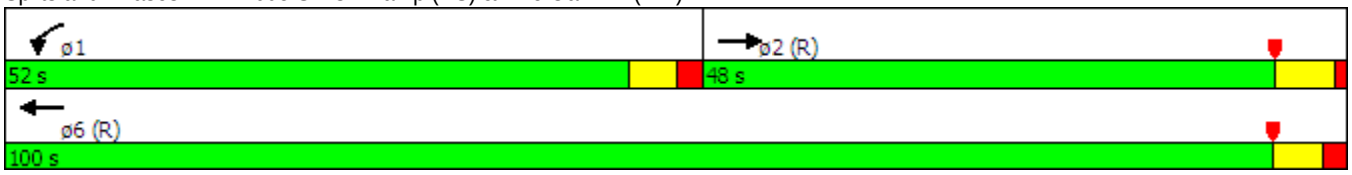
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.4		49.6		50.4		49.6
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		45.5		46.0		45.5		46.0
Max Q Clear Time (g_c+I1), s		5.5		8.3		3.6		45.2
Green Ext Time (p_c), s		0.6		6.0		0.6		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	24.2
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1270	978	693	1338	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	48.0		52.0	100.0		
Total Split (%)	48.0%		52.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



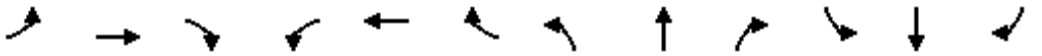
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1270	978	693	1338	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	1366	0	745	1439		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	1653	740	840	3531		
Arrive On Green	0.46	0.00	0.93	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	1366	0	745	1439		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	33.0	0.0	16.8	0.0		
Cycle Q Clear(g_c), s	33.0	0.0	16.8	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	1653	740	840	3531		
V/C Ratio(X)	0.83	0.00	0.89	0.41		
Avail Cap(c_a), veh/h	1653	740	840	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	23.6	0.0	2.5	0.0		
Incr Delay (d2), s/veh	4.9	0.0	13.4	0.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(0%),veh/ln	17.4	0.0	9.3	0.2		
LnGrp Delay(d),s/veh	28.5	0.0	15.9	0.4		
LnGrp LOS	C		B	A		
Approach Vol, veh/h	1366			2184		
Approach Delay, s/veh	28.5			5.7		
Approach LOS	C			A		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	52.0	51.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	46.4	* 43				94.4		
Max Q Clear Time (g_c+I1), s	18.8	35.0				2.0		
Green Ext Time (p_c), s	7.1	7.4				78.1		

Intersection Summary	
HCM 2010 Ctrl Delay	14.4
HCM 2010 LOS	B

Notes

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	1270	0	0	1350	0	0	0	701	0	0	681
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	132.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1270	0	0	1350	0	0	0	701	0	0	681
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1309	0	0	1392	0	0	0	723	0	0	702

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1392	0	0	1309	0	0	2005	2701	655	2047	2701	696
Stage 1	-	-	-	-	-	-	1309	1309	-	1392	1392	-
Stage 2	-	-	-	-	-	-	696	1392	-	655	1309	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	498	-	-	535	-	-	36	22	~ 413	33	22	~ 389
Stage 1	-	-	-	-	-	-	171	231	-	152	211	-
Stage 2	-	-	-	-	-	-	403	211	-	426	231	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	498	-	-	535	-	-	-	22	~ 413	-	22	~ 389
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	22	-	-	22	-
Stage 1	-	-	-	-	-	-	171	231	-	152	211	-
Stage 2	-	-	-	-	-	-	-	211	-	-	231	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	$ 370.4	$ 396.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	413	498	-	-	535	-	-	389
HCM Lane V/C Ratio	1.75	-	-	-	-	-	-	1.805
HCM Control Delay (s)	$ 370.4	0	-	-	0	-	-	$ 396.1
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	44.8	0	-	-	0	-	-	45

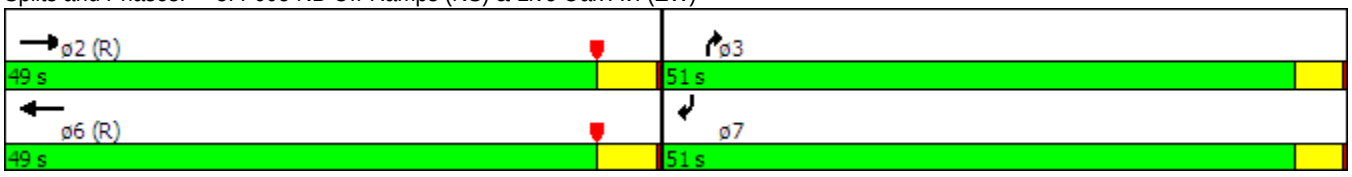
Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1270	0	0	1350	0	0	0	701	0	0	681
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Detector Phase		2			6				3			7
Switch Phase												
Minimum Initial (s)		10.0			10.0				4.0			4.0
Minimum Split (s)		21.0			21.0				8.0			8.0
Total Split (s)		49.0			49.0				51.0			51.0
Total Split (%)		49.0%			49.0%				51.0%			51.0%
Yellow Time (s)		4.5			4.5				3.5			3.5
All-Red Time (s)		0.5			0.5				0.5			0.5
Lost Time Adjust (s)		0.0			0.0				0.0			0.0
Total Lost Time (s)		5.0			5.0				4.0			4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max				None			None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 83 (83%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1270	0	0	1350	0	0	0	701	0	0	681
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	0	0	1900	0	0	0	1900	0	0	1900
Adj Flow Rate, veh/h	0	1309	0	0	1392	0	0	0	723	0	0	702
Adj No. of Lanes	0	2	0	0	2	0	0	0	2	0	0	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	3430	0	0	3430	0	0	0	0	0	0	0
Arrive On Green	0.00	0.64	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	3800	0	0	3800	0		0			0	
Grp Volume(v), veh/h	0	1309	0	0	1392	0		0.0			0.0	
Grp Sat Flow(s),veh/h/ln	0	1805	0	0	1805	0						
Q Serve(g_s), s	0.0	17.4	0.0	0.0	0.0	0.0						
Cycle Q Clear(g_c), s	0.0	17.4	0.0	0.0	0.0	0.0						
Prop In Lane	0.00		0.00	0.00		0.00						
Lane Grp Cap(c), veh/h	0	3430	0	0	3430	0						
V/C Ratio(X)	0.00	0.38	0.00	0.00	0.41	0.00						
Avail Cap(c_a), veh/h	0	3430	0	0	3430	0						
HCM Platoon Ratio	1.00	0.67	1.00	1.00	2.00	1.00						
Upstream Filter(I)	0.00	0.33	0.00	0.00	0.90	0.00						
Uniform Delay (d), s/veh	0.0	4.1	0.0	0.0	0.0	0.0						
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.3	0.0						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(0%),veh/ln	0.0	8.7	0.0	0.0	0.2	0.0						
LnGrp Delay(d),s/veh	0.0	4.2	0.0	0.0	0.3	0.0						
LnGrp LOS		A			A							
Approach Vol, veh/h		1309			1392							
Approach Delay, s/veh		4.2			0.3							
Approach LOS		A			A							

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		
Phs Duration (G+Y+Rc), s		100.0				100.0		
Change Period (Y+Rc), s		5.0				5.0		
Max Green Setting (Gmax), s		44.0				44.0		
Max Q Clear Time (g_c+I1), s		19.4				2.0		
Green Ext Time (p_c), s		23.1				38.0		

Intersection Summary	
HCM 2010 Ctrl Delay	2.2
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1926	44	33	1333	17	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	66.0	66.0	8.0	74.0	26.0	
Total Split (%)	66.0%	66.0%	8.0%	74.0%	26.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 8 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



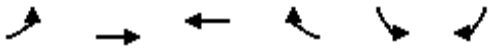
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1926	44	33	1333	17	21
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2093	48	36	1449	18	23
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	3027	1354	46	3227	23	29
Arrive On Green	1.00	1.00	0.05	1.00	0.03	0.03
Sat Flow, veh/h	3705	1615	1810	3705	728	931
Grp Volume(v), veh/h	2093	48	36	1449	42	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1699	0
Q Serve(g_s), s	0.0	0.0	2.0	0.0	2.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	2.0	0.0	2.5	0.0
Prop In Lane		1.00	1.00		0.43	0.55
Lane Grp Cap(c), veh/h	3027	1354	46	3227	53	0
V/C Ratio(X)	0.69	0.04	0.79	0.45	0.79	0.00
Avail Cap(c_a), veh/h	3027	1354	90	3227	391	0
HCM Platoon Ratio	1.33	1.33	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	47.2	0.0	48.1	0.0
Incr Delay (d2), s/veh	1.3	0.0	10.5	0.5	22.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.6	0.0	1.1	0.2	1.5	0.0
LnGrp Delay(d),s/veh	1.3	0.0	57.7	0.5	70.9	0.0
LnGrp LOS	A	A	E	A	E	
Approach Vol, veh/h	2141			1485	42	
Approach Delay, s/veh	1.3			1.8	70.9	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.5	88.4				93.9		6.1
Change Period (Y+Rc), s	3.0	4.5				4.5		3.0
Max Green Setting (Gmax), s	5.0	61.5				69.5		23.0
Max Q Clear Time (g_c+I1), s	4.0	2.0				2.0		4.5
Green Ext Time (p_c), s	0.0	56.7				63.9		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	2.3
HCM 2010 LOS	A

Notes

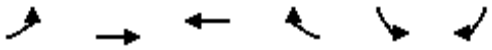
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	45	1883	1286	6	11	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	45	1883	1286	6	11	69
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	47	1982	1354	6	12	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.77				0.62	0.77
vC, conflicting volume	1360				2439	677
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	867				428	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				96	91
cM capacity (veh/h)	604				321	839

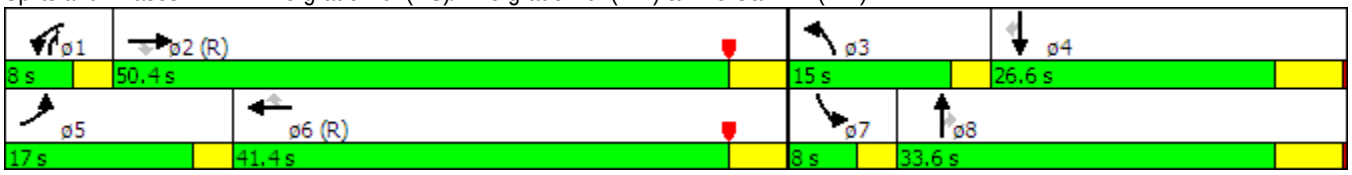
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	47	991	991	677	677	6	84
Volume Left	47	0	0	0	0	0	12
Volume Right	0	0	0	0	0	6	73
cSH	604	1700	1700	1700	1700	1700	687
Volume to Capacity	0.08	0.58	0.58	0.40	0.40	0.00	0.12
Queue Length 95th (ft)	6	0	0	0	0	0	10
Control Delay (s)	11.5	0.0	0.0	0.0	0.0	0.0	11.0
Lane LOS	B						B
Approach Delay (s)	0.3			0.0			11.0
Approach LOS							B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	1692	20	84	1041	6	97	66	364	26	22	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	17.0	50.4	50.4	8.0	41.4	41.4	15.0	33.6	8.0	8.0	26.6	26.6
Total Split (%)	17.0%	50.4%	50.4%	8.0%	41.4%	41.4%	15.0%	33.6%	8.0%	8.0%	26.6%	26.6%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	190	1692	20	84	1041	6	97	66	364	26	22	157
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	207	1839	0	91	1132	7	105	72	396	28	24	171
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	237	1837	822	90	1544	691	132	493	500	39	751	336
Arrive On Green	0.17	0.68	0.00	0.10	0.86	0.86	0.07	0.26	0.26	0.01	0.07	0.07
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	207	1839	0	91	1132	7	105	72	396	28	24	171
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	11.1	50.9	0.0	5.0	12.2	0.1	5.7	2.9	22.4	1.5	0.6	10.2
Cycle Q Clear(g_c), s	11.1	50.9	0.0	5.0	12.2	0.1	5.7	2.9	22.4	1.5	0.6	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	1837	822	90	1544	691	132	493	500	39	751	336
V/C Ratio(X)	0.87	1.00	0.00	1.01	0.73	0.01	0.79	0.15	0.79	0.72	0.03	0.51
Avail Cap(c_a), veh/h	253	1837	822	90	1544	691	217	534	535	90	762	341
HCM Platoon Ratio	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	0.89	0.89	0.89	1.00	1.00	1.00	0.99	0.99	0.99
Uniform Delay (d), s/veh	40.5	16.2	0.0	45.0	5.0	4.1	45.6	28.5	31.6	49.3	37.2	41.6
Incr Delay (d2), s/veh	24.1	21.3	0.0	90.8	2.8	0.0	4.0	0.2	8.5	8.6	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	7.1	30.2	0.0	4.7	5.9	0.0	3.0	1.6	11.2	0.9	0.3	4.8
LnGrp Delay(d),s/veh	64.6	37.4	0.0	135.8	7.8	4.2	49.7	28.7	40.1	58.0	37.2	43.7
LnGrp LOS	E	F		F	A	A	D	C	D	E	D	D
Approach Vol, veh/h		2046			1230			573			223	
Approach Delay, s/veh		40.2			17.3			40.4			44.8	
Approach LOS		D			B			D			D	

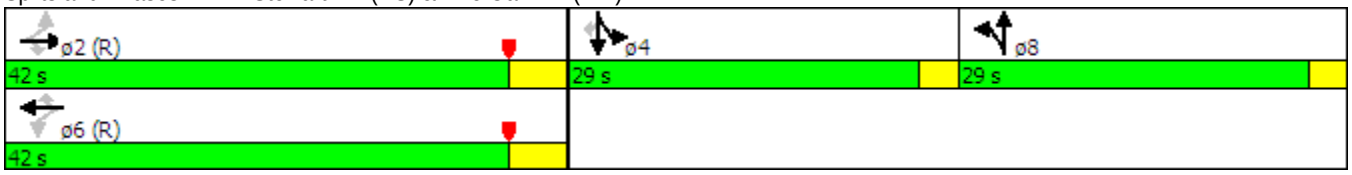
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	55.4	10.3	26.3	16.1	47.3	5.2	31.5
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	5.0	45.9	12.0	21.1	14.0	36.9	5.0	28.1
Max Q Clear Time (g_c+I1), s	7.0	52.9	7.7	12.2	13.1	14.2	3.5	24.4
Green Ext Time (p_c), s	0.0	0.0	0.0	3.0	0.0	21.6	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	33.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	1956	264	41	1028	7	68	21	14	23	101	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 19 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	58	1956	264	41	1028	7	68	21	14	23	101	13
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	63	2126	287	45	1117	8	74	23	15	25	110	14
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	445	2646	1184	179	2646	1184	97	30	20	146	153	130
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.08	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	509	3610	1615	145	3610	1615	1188	369	241	1810	1900	1615
Grp Volume(v), veh/h	63	2126	287	45	1117	8	112	0	0	25	110	14
Grp Sat Flow(s),veh/h/ln	509	1805	1615	145	1805	1615	1798	0	0	1810	1900	1615
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0	1.3	5.7	0.8
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0	1.3	5.7	0.8
Prop In Lane	1.00		1.00	1.00		1.00	0.66		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	445	2646	1184	179	2646	1184	147	0	0	146	153	130
V/C Ratio(X)	0.14	0.80	0.24	0.25	0.42	0.01	0.76	0.00	0.00	0.17	0.72	0.11
Avail Cap(c_a), veh/h	445	2646	1184	179	2646	1184	468	0	0	470	494	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.35	0.35	0.35	0.77	0.77	0.77	1.00	0.00	0.00	0.42	0.42	0.42
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	45.0	0.0	0.0	42.9	44.9	42.6
Incr Delay (d2), s/veh	0.2	1.0	0.2	2.6	0.4	0.0	8.0	0.0	0.0	0.2	2.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.0	0.4	0.1	0.1	0.1	0.0	3.3	0.0	0.0	0.7	3.1	0.4
LnGrp Delay(d),s/veh	0.2	1.0	0.2	2.6	0.4	0.0	52.9	0.0	0.0	43.1	47.5	42.8
LnGrp LOS	A	A	A	A	A	A	D			D	D	D
Approach Vol, veh/h		2476			1170			112			149	
Approach Delay, s/veh		0.9			0.5			52.9			46.3	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		77.8		11.1		77.8		11.2
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		2.0		7.7		2.0		8.1
Green Ext Time (p_c), s		28.5		0.5		28.5		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	4.0
HCM 2010 LOS	A

Notes

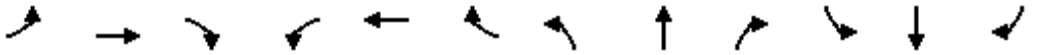
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1341	522	265	1088	23	94	5	87	23	7	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		50	200		0	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	60			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1141			511			1039			220	
Travel Time (s)		17.3			7.7			23.6			5.0	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Detector Phase	5	2	2	1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	10.0	10.0		4.0	4.0	
Minimum Split (s)	8.0	20.5	20.5	8.0	20.0	20.0	20.5	20.5		8.0	20.0	
Total Split (s)	9.0	42.5	42.5	17.0	50.5	50.5	20.5	31.5		9.0	20.0	
Total Split (%)	9.0%	42.5%	42.5%	17.0%	50.5%	50.5%	20.5%	31.5%		9.0%	20.0%	
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5		3.5	3.5	
All-Red Time (s)	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	1341	522	265	1088	23	94	5	87	23	7	36
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	25	1458	567	288	1183	25	102	5	95	25	8	39
Adj No. of Lanes	1	2	1	1	2	1	2	1	0	1	1	0
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	36	1480	662	235	1877	840	562	22	417	36	35	172
Arrive On Green	0.04	0.82	0.82	0.26	1.00	1.00	0.16	0.27	0.27	0.02	0.13	0.13
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	3510	81	1546	1810	282	1375
Grp Volume(v), veh/h	25	1458	567	288	1183	25	102	0	100	25	0	47
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1755	0	1627	1810	0	1657
Q Serve(g_s), s	1.4	37.8	21.2	13.0	0.0	0.0	2.5	0.0	4.8	1.4	0.0	2.6
Cycle Q Clear(g_c), s	1.4	37.8	21.2	13.0	0.0	0.0	2.5	0.0	4.8	1.4	0.0	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.83
Lane Grp Cap(c), veh/h	36	1480	662	235	1877	840	562	0	439	36	0	207
V/C Ratio(X)	0.69	0.99	0.86	1.22	0.63	0.03	0.18	0.00	0.23	0.69	0.00	0.23
Avail Cap(c_a), veh/h	90	1480	662	235	1877	840	562	0	439	90	0	265
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.38	0.38	0.38	0.81	0.81	0.81	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.7	8.7	7.2	37.0	0.0	0.0	36.3	0.0	28.4	48.7	0.0	39.4
Incr Delay (d2), s/veh	8.5	11.3	5.7	127.6	1.3	0.1	0.7	0.0	1.2	20.8	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.8	19.3	9.5	14.7	0.3	0.0	1.3	0.0	2.3	0.9	0.0	1.2
LnGrp Delay(d),s/veh	56.2	20.1	12.9	164.6	1.3	0.1	37.0	0.0	29.6	69.5	0.0	39.9
LnGrp LOS	E	C	B	F	A	A	D		C	E		D
Approach Vol, veh/h		2050			1496			202			72	
Approach Delay, s/veh		18.5			32.7			33.4			50.2	
Approach LOS		B			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	45.5	20.5	17.0	6.0	56.5	6.0	31.5
Change Period (Y+Rc), s	4.0	4.5	4.5	* 4.5	4.0	4.5	4.0	4.5
Max Green Setting (Gmax), s	13.0	38.0	16.0	* 16	5.0	46.0	5.0	27.0
Max Q Clear Time (g_c+I1), s	15.0	39.8	4.5	4.6	3.4	2.0	3.4	6.8
Green Ext Time (p_c), s	0.0	0.0	0.4	0.8	0.0	41.5	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	25.5
HCM 2010 LOS	C

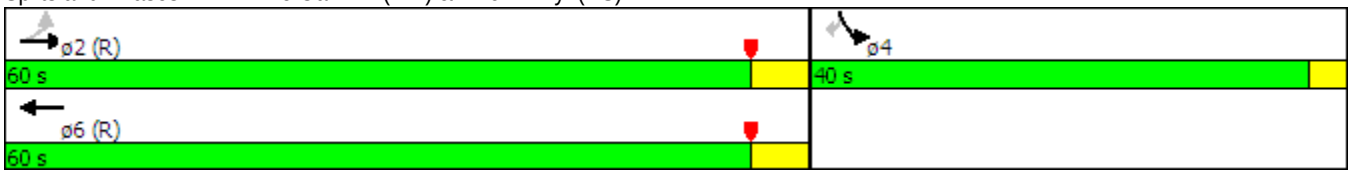
Notes

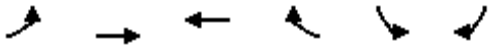
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	58	1393	1224	0	987	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	20.0	20.0	28.5		27.0	27.0
Total Split (s)	60.0	60.0	60.0		40.0	40.0
Total Split (%)	60.0%	60.0%	60.0%		40.0%	40.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 21 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	58	1393	1224	0	987	153
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	60	1436	1262	0	1018	158
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	244	2167	2167	0	1140	524
Arrive On Green	1.00	1.00	0.60	0.00	0.32	0.32
Sat Flow, veh/h	446	3705	3800	0	3510	1615
Grp Volume(v), veh/h	60	1436	1262	0	1018	158
Grp Sat Flow(s),veh/h/ln	446	1805	1805	0	1755	1615
Q Serve(g_s), s	6.2	0.0	21.5	0.0	27.6	7.3
Cycle Q Clear(g_c), s	27.7	0.0	21.5	0.0	27.6	7.3
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	244	2167	2167	0	1140	524
V/C Ratio(X)	0.25	0.66	0.58	0.00	0.89	0.30
Avail Cap(c_a), veh/h	244	2167	2167	0	1299	598
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	5.0	0.0	12.3	0.0	32.1	25.3
Incr Delay (d2), s/veh	0.2	0.1	1.2	0.0	7.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	0.8	0.0	10.9	0.0	14.5	3.3
LnGrp Delay(d),s/veh	5.2	0.1	13.4	0.0	39.7	25.6
LnGrp LOS	A	A	B		D	C
Approach Vol, veh/h		1496	1262		1176	
Approach Delay, s/veh		0.3	13.4		37.8	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		64.5		35.5		64.5		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		55.5		37.0		55.5		
Max Q Clear Time (g_c+I1), s		29.7		29.6		23.5		
Green Ext Time (p_c), s		24.4		2.9		29.9		

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1877	492	63	1825	254	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	80.0	80.0	80.0	80.0	20.0	20.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1877	492	63	1825	254	99
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2040	535	68	1984	276	108
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2708	1211	125	3890	562	258
Arrive On Green	0.75	0.75	0.75	0.75	0.16	0.16
Sat Flow, veh/h	3705	1615	124	5358	3510	1615
Grp Volume(v), veh/h	2040	535	68	1984	276	108
Grp Sat Flow(s),veh/h/ln	1805	1615	124	1729	1755	1615
Q Serve(g_s), s	32.5	12.4	42.5	15.5	7.2	6.0
Cycle Q Clear(g_c), s	32.5	12.4	75.0	15.5	7.2	6.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2708	1211	125	3890	562	258
V/C Ratio(X)	0.75	0.44	0.55	0.51	0.49	0.42
Avail Cap(c_a), veh/h	2708	1211	125	3890	562	258
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.2	4.7	33.6	5.1	38.3	37.8
Incr Delay (d2), s/veh	2.0	1.2	16.1	0.5	3.1	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	16.6	5.7	2.4	7.3	3.7	3.0
LnGrp Delay(d),s/veh	9.2	5.8	49.7	5.5	41.3	42.7
LnGrp LOS	A	A	D	A	D	D
Approach Vol, veh/h	2575			2052	384	
Approach Delay, s/veh	8.5			7.0	41.7	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		80.0				80.0		20.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		75.0				75.0		16.0
Max Q Clear Time (g_c+I1), s		34.5				77.0		9.2
Green Ext Time (p_c), s		40.4				0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	10.4
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	235	13	15	898	1127	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			100
Storage Lanes	1	1	1			0
Taper Length (ft)	25		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			45	45	
Link Distance (ft)	296			257	167	
Travel Time (s)	6.7			3.9	2.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	32.0	32.0	8.0	68.0	60.0	60.0
Total Split (%)	32.0%	32.0%	8.0%	68.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 16: Arrow Hwy. (NS) & Driveway 1 (EW)





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	235	13	15	898	1127	219
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	247	14	16	945	1186	231
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	288	257	26	2747	2551	1141
Arrive On Green	0.16	0.16	0.01	0.76	1.00	1.00
Sat Flow, veh/h	1810	1615	1810	3705	3705	1615
Grp Volume(v), veh/h	247	14	16	945	1186	231
Grp Sat Flow(s),veh/h/ln	1810	1615	1810	1805	1805	1615
Q Serve(g_s), s	13.3	0.7	0.9	8.5	0.0	0.0
Cycle Q Clear(g_c), s	13.3	0.7	0.9	8.5	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	288	257	26	2747	2551	1141
V/C Ratio(X)	0.86	0.05	0.62	0.34	0.46	0.20
Avail Cap(c_a), veh/h	507	452	72	2747	2551	1141
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	35.7	49.0	3.9	0.0	0.0
Incr Delay (d2), s/veh	7.4	0.1	21.4	0.3	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(0%),veh/ln	7.2	0.7	0.6	4.3	0.2	0.1
LnGrp Delay(d),s/veh	48.3	35.8	70.4	4.2	0.6	0.4
LnGrp LOS	D	D	E	A	A	A
Approach Vol, veh/h	261			961	1417	
Approach Delay, s/veh	47.7			5.3	0.6	
Approach LOS	D			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		80.1		19.9	5.4	74.7		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		64.0		28.0	4.0	56.0		
Max Q Clear Time (g_c+I1), s		10.5		15.3	2.9	2.0		
Green Ext Time (p_c), s		26.6		0.6	0.0	26.7		

Intersection Summary	
HCM 2010 Ctrl Delay	7.0
HCM 2010 LOS	A



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	6	2	4	1129	1344	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Link Speed (mph)	30			45	45	
Link Distance (ft)	301			157	350	
Travel Time (s)	6.8			2.4	5.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	6	2	4	1129	1344	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	2	4	1188	1415	42

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2018	707	1415	0	-	0
Stage 1	1415	-	-	-	-	-
Stage 2	603	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	52	382	488	-	-	-
Stage 1	194	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	51	382	488	-	-	-
Mov Cap-2 Maneuver	146	-	-	-	-	-
Stage 1	194	-	-	-	-	-
Stage 2	503	-	-	-	-	-

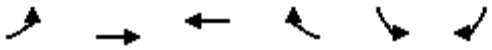
Approach	EB	NB	SB
HCM Control Delay, s	26.9	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	488	-	173	-	-
HCM Lane V/C Ratio	0.009	-	0.049	-	-
HCM Control Delay (s)	12.4	0.1	26.9	-	-
HCM Lane LOS	B	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

VOLUME-TO-CAPACITY RATIO

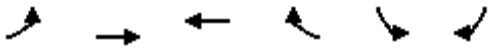
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	555	0	120	1653	914	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	603	0	130	1797	993	214
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	603	0	130	1797	993	214
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	48.5		7.4	59.9	32.1	100.0
Effective Green, g (s)	48.5		7.4	59.9	32.1	100.0
Actuated g/C Ratio	0.48		0.07	0.60	0.32	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1750		259	2162	1124	1615
v/s Ratio Prot	0.17		0.04	c0.50	c0.28	
v/s Ratio Perm						0.13
v/c Ratio	0.34		0.50	0.83	0.88	0.13
Uniform Delay, d1	15.9		44.5	16.0	32.2	0.0
Progression Factor	1.00		1.20	0.79	1.02	1.00
Incremental Delay, d2	0.5		0.3	1.4	8.0	0.2
Delay (s)	16.5		53.5	14.0	40.8	0.2
Level of Service	B		D	B	D	A
Approach Delay (s)	16.5			16.7	33.6	
Approach LOS	B			B	C	

Intersection Summary			
Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	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			



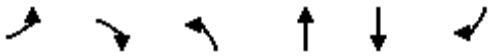
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	288	455	1648	644	121	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	313	495	1791	700	132	133
RTOR Reduction (vph)	0	0	0	269	0	121
Lane Group Flow (vph)	313	495	1791	431	132	12
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	27.3	80.4	50.1	50.1	9.1	9.1
Effective Green, g (s)	27.3	80.4	50.1	50.1	9.1	9.1
Actuated g/C Ratio	0.27	0.80	0.50	0.50	0.09	0.09
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	492	2902	1808	809	318	146
v/s Ratio Prot	c0.17	0.14	c0.50		c0.04	
v/s Ratio Perm				0.27		0.01
v/c Ratio	0.64	0.17	0.99	0.53	0.42	0.08
Uniform Delay, d1	32.0	2.2	24.7	17.0	42.9	41.6
Progression Factor	0.60	3.14	0.94	1.73	1.00	1.00
Incremental Delay, d2	1.9	0.1	14.4	1.5	0.9	0.2
Delay (s)	21.0	7.1	37.7	31.0	43.8	41.9
Level of Service	C	A	D	C	D	D
Approach Delay (s)		12.5	35.8		42.8	
Approach LOS		B	D		D	

Intersection Summary			
Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



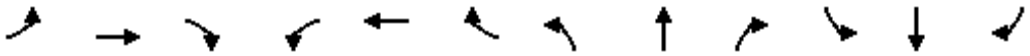
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	576	1776	0	538	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	613	1889	0	572	548
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	613	1889	0	572	548
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		56.6	56.6		33.8	100.0
Effective Green, g (s)		56.6	56.6		33.8	100.0
Actuated g/C Ratio		0.57	0.57		0.34	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2935	2043		610	1615
v/s Ratio Prot		0.12	c0.52		c0.32	
v/s Ratio Perm						0.34
v/c Ratio		0.21	0.92		0.94	0.34
Uniform Delay, d1		10.7	19.8		32.1	0.0
Progression Factor		1.83	1.04		1.00	1.00
Incremental Delay, d2		0.2	6.1		22.1	0.6
Delay (s)		19.7	26.8		54.1	0.6
Level of Service		B	C		D	A
Approach Delay (s)		19.7	26.8		27.9	
Approach LOS		B	C		C	

Intersection Summary			
Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	233	112	131	2042	577	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.41	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	787	3610	3610	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	253	122	142	2220	627	324
RTOR Reduction (vph)	0	107	0	0	0	68
Lane Group Flow (vph)	253	15	142	2220	627	256
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	12.5	12.5	79.0	79.0	79.0	79.0
Effective Green, g (s)	12.5	12.5	79.0	79.0	79.0	79.0
Actuated g/C Ratio	0.12	0.12	0.79	0.79	0.79	0.79
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	437	201	621	2851	2851	1275
v/s Ratio Prot	c0.07			c0.61	0.17	
v/s Ratio Perm		0.01	0.18			0.16
v/c Ratio	0.58	0.08	0.23	0.78	0.22	0.20
Uniform Delay, d1	41.3	38.6	2.7	5.7	2.7	2.6
Progression Factor	1.15	1.45	0.62	0.39	1.80	7.25
Incremental Delay, d2	1.9	0.2	0.6	1.5	0.2	0.3
Delay (s)	49.3	56.1	2.3	3.7	5.0	19.3
Level of Service	D	E	A	A	A	B
Approach Delay (s)	51.6			3.6	9.9	
Approach LOS	D			A	A	

Intersection Summary			
Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



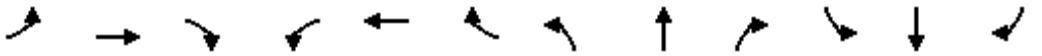
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	211	10	94	369	12	10	9	90	8	6	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3586		1805	3594		1805	1641			1747	
Flt Permitted	0.29	1.00		0.52	1.00		0.74	1.00			0.95	
Satd. Flow (perm)	551	3586		987	3594		1399	1641			1686	
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)	26	237	11	106	415	13	11	10	101	9	7	16
RTOR Reduction (vph)	0	6	0	0	4	0	0	27	0	0	4	0
Lane Group Flow (vph)	26	242	0	106	424	0	11	84	0	0	28	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)	18.2	18.2		18.2	18.2		73.3	73.3			73.3	
Effective Green, g (s)	18.2	18.2		18.2	18.2		73.3	73.3			73.3	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.73	0.73			0.73	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	100	652		179	654		1025	1202			1235	
v/s Ratio Prot		0.07			c0.12			c0.05				
v/s Ratio Perm	0.05			0.11			0.01				0.02	
v/c Ratio	0.26	0.37		0.59	0.65		0.01	0.07			0.02	
Uniform Delay, d1	35.1	35.9		37.5	37.9		3.6	3.8			3.6	
Progression Factor	0.66	0.70		0.86	0.83		0.41	0.29			1.00	
Incremental Delay, d2	1.2	0.3		5.1	2.2		0.0	0.1			0.0	
Delay (s)	24.6	25.5		37.3	33.6		1.5	1.2			3.7	
Level of Service	C	C		D	C		A	A			A	
Approach Delay (s)		25.4			34.4			1.2			3.7	
Approach LOS		C			C			A			A	

Intersection Summary			
Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	316	611	799	1355	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	336	650	850	1441	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	336	650	850	1441	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	20.5	100.0	68.4	100.0		
Effective Green, g (s)	20.5	100.0	68.4	100.0		
Actuated g/C Ratio	0.20	1.00	0.68	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	740	1615	1234	3610		
v/s Ratio Prot	0.09		c0.47	0.40		
v/s Ratio Perm		c0.40				
v/c Ratio	0.45	0.40	0.69	0.40		
Uniform Delay, d1	34.8	0.0	9.4	0.0		
Progression Factor	0.86	1.00	0.67	1.00		
Incremental Delay, d2	2.0	0.7	3.0	0.3		
Delay (s)	31.8	0.7	9.3	0.3		
Level of Service	C	A	A	A		
Approach Delay (s)	11.3			3.6	0.0	
Approach LOS	B			A	A	

Intersection Summary			
Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	316	0	0	1558	0	0	0	783	0	0	596
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0				4.0			4.0
Lane Util. Factor		0.95			0.91				0.88			1.00
Frt		1.00			1.00				0.85			0.86
Flt Protected		1.00			1.00				1.00			1.00
Satd. Flow (prot)		3610			5187				2842			1644
Flt Permitted		1.00			1.00				1.00			1.00
Satd. Flow (perm)		3610			5187				2842			1644
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	326	0	0	1606	0	0	0	807	0	0	614
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	383	0	0	13
Lane Group Flow (vph)	0	326	0	0	1606	0	0	0	424	0	0	601
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Actuated Green, G (s)		48.1			48.1				42.9			42.9
Effective Green, g (s)		48.1			48.1				42.9			42.9
Actuated g/C Ratio		0.48			0.48				0.43			0.43
Clearance Time (s)		5.0			5.0				4.0			4.0
Vehicle Extension (s)		4.5			4.5				3.0			3.0
Lane Grp Cap (vph)		1736			2494				1219			705
v/s Ratio Prot		0.09			c0.31				0.15			c0.37
v/s Ratio Perm												
v/c Ratio		0.19			0.64				0.35			0.85
Uniform Delay, d1		14.8			19.5				19.2			25.7
Progression Factor		2.62			0.56				1.00			1.00
Incremental Delay, d2		0.2			1.1				0.2			9.8
Delay (s)		39.0			11.9				19.3			35.5
Level of Service		D			B				B			D
Approach Delay (s)		39.0			11.9			19.3			35.5	
Approach LOS		D			B			B			D	

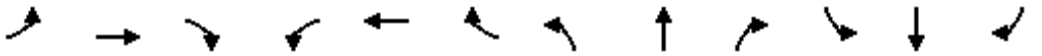
Intersection Summary			
Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	996	103	46	1410	148	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3610	1615	1805	3610	1766	
Flt Permitted	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (perm)	3610	1615	1805	3610	1766	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1083	112	50	1533	161	61
RTOR Reduction (vph)	0	16	0	0	15	0
Lane Group Flow (vph)	1083	96	50	1533	207	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	67.7	67.7	4.9	75.6	16.9	
Effective Green, g (s)	67.7	67.7	4.9	75.6	16.9	
Actuated g/C Ratio	0.68	0.68	0.05	0.76	0.17	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2443	1093	88	2729	298	
v/s Ratio Prot	0.30		0.03	c0.42	c0.12	
v/s Ratio Perm		0.06				
v/c Ratio	0.44	0.09	0.57	0.56	0.69	
Uniform Delay, d1	7.5	5.5	46.5	5.2	39.1	
Progression Factor	0.83	0.87	0.78	2.35	1.00	
Incremental Delay, d2	0.6	0.2	4.2	0.7	6.9	
Delay (s)	6.8	5.0	40.4	12.9	46.0	
Level of Service	A	A	D	B	D	
Approach Delay (s)	6.6			13.8	46.0	
Approach LOS	A			B	D	

Intersection Summary			
Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

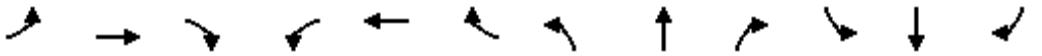
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	182	711	84	253	1170	13	40	51	109	29	76	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
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)	198	773	91	275	1272	14	43	55	118	32	83	189
RTOR Reduction (vph)	0	0	44	0	0	6	0	0	74	0	0	170
Lane Group Flow (vph)	198	773	47	275	1272	8	43	55	44	32	83	19
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	16.2	51.8	51.8	18.4	54.0	54.0	3.8	8.4	26.8	5.4	10.0	10.0
Effective Green, g (s)	16.2	51.8	51.8	18.4	54.0	54.0	3.8	8.4	26.8	5.4	10.0	10.0
Actuated g/C Ratio	0.16	0.52	0.52	0.18	0.54	0.54	0.04	0.08	0.27	0.05	0.10	0.10
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	292	1869	836	332	1949	872	68	159	432	97	361	161
v/s Ratio Prot	0.11	0.21		c0.15	c0.35		c0.02	c0.03	0.02	0.02	0.02	
v/s Ratio Perm			0.03			0.00			0.01			0.01
v/c Ratio	0.68	0.41	0.06	0.83	0.65	0.01	0.63	0.35	0.10	0.33	0.23	0.12
Uniform Delay, d1	39.4	14.8	12.0	39.3	16.3	10.6	47.4	43.2	27.5	45.6	41.5	41.0
Progression Factor	0.87	0.70	2.38	1.23	0.57	1.00	1.00	1.00	1.00	0.37	0.29	0.43
Incremental Delay, d2	4.5	0.6	0.1	9.6	1.1	0.0	13.2	2.3	0.0	0.7	0.6	0.6
Delay (s)	38.7	11.0	28.6	57.8	10.4	10.6	60.6	45.5	27.6	17.4	12.4	18.2
Level of Service	D	B	C	E	B	B	E	D	C	B	B	B
Approach Delay (s)		17.6			18.7			38.7			16.5	
Approach LOS		B			B			D			B	

Intersection Summary				
Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



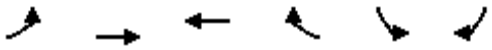
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	661	26	19	1517	38	210	120	37	13	28	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1822		1805	1900	1615
Flt Permitted	0.07	1.00	1.00	0.33	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	135	3610	1615	629	3610	1615		1822		1805	1900	1615
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)	21	718	28	21	1649	41	228	130	40	14	30	83
RTOR Reduction (vph)	0	0	12	0	0	14	0	4	0	0	0	78
Lane Group Flow (vph)	21	718	16	21	1649	27	0	394	0	14	30	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	56.3	56.3	56.3	56.3	56.3	56.3		27.0		6.2	6.2	6.2
Effective Green, g (s)	56.3	56.3	56.3	56.3	56.3	56.3		27.0		6.2	6.2	6.2
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56	0.56		0.27		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	76	2032	909	354	2032	909		491		111	117	100
v/s Ratio Prot		0.20			c0.46			c0.22		0.01	c0.02	
v/s Ratio Perm	0.16		0.01	0.03		0.02						0.00
v/c Ratio	0.28	0.35	0.02	0.06	0.81	0.03		0.80		0.13	0.26	0.05
Uniform Delay, d1	11.3	11.9	9.6	9.9	17.6	9.7		34.0		44.3	44.7	44.1
Progression Factor	1.91	1.85	3.73	1.78	1.61	2.47		1.00		1.91	1.84	4.33
Incremental Delay, d2	8.3	0.5	0.0	0.2	2.4	0.0		9.2		0.5	1.2	0.2
Delay (s)	29.9	22.5	36.0	17.8	30.7	24.0		43.2		85.2	83.6	191.1
Level of Service	C	C	D	B	C	C		D		F	F	F
Approach Delay (s)		23.2			30.4			43.2			154.0	
Approach LOS		C			C			D			F	

Intersection Summary				
Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	77.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	525	63	134	1376	43	296	10	293	12	4	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.87	
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)	1805	3610	1615	1805	3610	1615	3502	1625		1805	1661	
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)	1805	3610	1615	1805	3610	1615	3502	1625		1805	1661	
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)	47	571	68	146	1496	47	322	11	318	13	4	21
RTOR Reduction (vph)	0	0	44	0	0	26	0	209	0	0	19	0
Lane Group Flow (vph)	47	571	24	146	1496	21	322	120	0	13	6	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	3.2	35.2	35.2	12.6	44.6	44.6	28.0	34.4		0.8	7.2	
Effective Green, g (s)	3.2	35.2	35.2	12.6	44.6	44.6	28.0	34.4		0.8	7.2	
Actuated g/C Ratio	0.03	0.35	0.35	0.13	0.45	0.45	0.28	0.34		0.01	0.07	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	4.5		3.0	3.0	
Lane Grp Cap (vph)	57	1270	568	227	1610	720	980	559		14	119	
v/s Ratio Prot	0.03	0.16		c0.08	c0.41		c0.09	c0.07		0.01	0.00	
v/s Ratio Perm			0.01			0.01						
v/c Ratio	0.82	0.45	0.04	0.64	0.93	0.03	0.33	0.22		0.93	0.05	
Uniform Delay, d1	48.1	24.9	21.3	41.6	26.2	15.5	28.5	23.2		49.6	43.2	
Progression Factor	1.39	0.71	1.00	1.18	0.67	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	57.8	1.1	0.1	5.4	9.9	0.1	0.9	0.9		201.0	0.2	
Delay (s)	124.7	18.7	21.4	54.4	27.5	15.6	29.4	24.1		250.5	43.4	
Level of Service	F	B	C	D	C	B	C	C		F	D	
Approach Delay (s)		26.2			29.5			26.8			114.2	
Approach LOS		C			C			C			F	

Intersection Summary				
Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	70.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

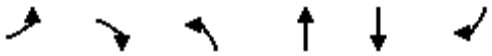


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	109	721	1456	0	369	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.14	1.00	1.00		0.95	1.00
Satd. Flow (perm)	269	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	112	743	1501	0	380	100
RTOR Reduction (vph)	0	0	0	0	0	51
Lane Group Flow (vph)	112	743	1501	0	380	49
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	76.4	76.4	76.4		16.1	16.1
Effective Green, g (s)	76.4	76.4	76.4		16.1	16.1
Actuated g/C Ratio	0.76	0.76	0.76		0.16	0.16
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	205	2758	2758		563	260
v/s Ratio Prot		0.21	0.42		c0.11	
v/s Ratio Perm	c0.42					0.03
v/c Ratio	0.55	0.27	0.54		0.67	0.19
Uniform Delay, d1	4.8	3.5	4.8		39.5	36.3
Progression Factor	1.34	0.41	0.84		0.75	0.52
Incremental Delay, d2	9.4	0.2	0.4		3.2	0.3
Delay (s)	15.8	1.7	4.4		32.9	19.3
Level of Service	B	A	A		C	B
Approach Delay (s)		3.5	4.4		30.0	
Approach LOS		A	A		C	

Intersection Summary			
Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	795	111	34	2656	619	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.29	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	558	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	864	121	37	2887	673	113
RTOR Reduction (vph)	0	29	0	0	0	36
Lane Group Flow (vph)	864	92	37	2887	673	77
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	65.0	65.0	65.0	65.0	26.0	26.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	26.0	26.0
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.26	0.26
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2346	1049	362	3371	910	419
v/s Ratio Prot	0.24			c0.56	c0.19	
v/s Ratio Perm		0.06	0.07			0.05
v/c Ratio	0.37	0.09	0.10	0.86	0.74	0.18
Uniform Delay, d1	8.1	6.5	6.6	13.8	33.9	28.8
Progression Factor	1.44	2.65	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2	0.6	3.0	5.4	1.0
Delay (s)	12.1	17.3	7.1	16.9	39.3	29.7
Level of Service	B	B	A	B	D	C
Approach Delay (s)	12.7			16.7	37.9	
Approach LOS	B			B	D	

Intersection Summary			
Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



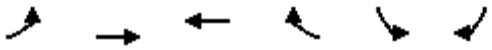
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	255	12	10	1917	454	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1805	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1805	1615	1805	3610	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	268	13	11	2018	478	179
RTOR Reduction (vph)	0	10	0	0	0	58
Lane Group Flow (vph)	268	3	11	2018	478	121
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	19.4	19.4	0.8	72.6	67.8	67.8
Effective Green, g (s)	19.4	19.4	0.8	72.6	67.8	67.8
Actuated g/C Ratio	0.19	0.19	0.01	0.73	0.68	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	313	14	2620	2447	1094
v/s Ratio Prot	c0.15		0.01	c0.56	0.13	
v/s Ratio Perm		0.00				0.08
v/c Ratio	0.77	0.01	0.79	0.77	0.20	0.11
Uniform Delay, d1	38.1	32.5	49.5	8.5	6.0	5.6
Progression Factor	1.00	1.00	1.03	0.74	1.00	1.12
Incremental Delay, d2	9.6	0.0	88.2	1.3	0.2	0.2
Delay (s)	47.8	32.5	139.1	7.6	6.2	6.5
Level of Service	D	C	F	A	A	A
Approach Delay (s)	47.1			8.3	6.2	
Approach LOS	D			A	A	

Intersection Summary			
Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



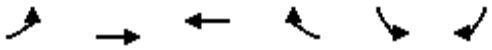
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	878	0	237	904	824	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	954	0	258	983	896	127
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	954	0	258	983	896	127
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	45.7		11.2	60.9	31.1	100.0
Effective Green, g (s)	45.7		11.2	60.9	31.1	100.0
Actuated g/C Ratio	0.46		0.11	0.61	0.31	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1649		392	2198	1089	1615
v/s Ratio Prot	c0.26		c0.07	0.27	c0.26	
v/s Ratio Perm						0.08
v/c Ratio	0.58		0.66	0.45	0.82	0.08
Uniform Delay, d1	20.0		42.6	10.5	31.9	0.0
Progression Factor	1.00		1.28	0.85	1.09	1.00
Incremental Delay, d2	1.5		2.9	0.6	4.8	0.1
Delay (s)	21.5		57.3	9.5	39.6	0.1
Level of Service	C		E	A	D	A
Approach Delay (s)	21.5			19.4	34.7	
Approach LOS	C			B	C	

Intersection Summary			
Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



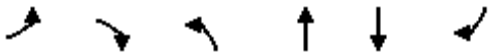
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	188	805	836	199	362	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	204	875	909	216	393	337
RTOR Reduction (vph)	0	0	0	98	0	280
Lane Group Flow (vph)	204	875	909	118	393	57
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	15.1	72.7	54.6	54.6	16.8	16.8
Effective Green, g (s)	15.1	72.7	54.6	54.6	16.8	16.8
Actuated g/C Ratio	0.15	0.73	0.55	0.55	0.17	0.17
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	272	2624	1971	881	588	271
v/s Ratio Prot	c0.11	0.24	c0.25		c0.11	
v/s Ratio Perm				0.07		0.04
v/c Ratio	0.75	0.33	0.46	0.13	0.67	0.21
Uniform Delay, d1	40.6	4.9	13.8	11.1	39.0	35.9
Progression Factor	0.49	2.95	0.83	0.90	1.00	1.00
Incremental Delay, d2	8.6	0.3	0.7	0.3	2.9	0.4
Delay (s)	28.7	14.8	12.2	10.3	41.9	36.3
Level of Service	C	B	B	B	D	D
Approach Delay (s)		17.5	11.8		39.3	
Approach LOS		B	B		D	

Intersection Summary			
Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



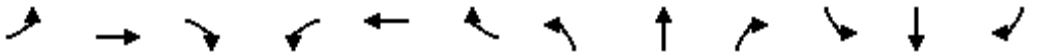
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	1167	729	0	420	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1268	792	0	457	333
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1268	792	0	457	333
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		58.5	58.5		31.9	100.0
Effective Green, g (s)		58.5	58.5		31.9	100.0
Actuated g/C Ratio		0.58	0.58		0.32	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		3034	2111		575	1615
v/s Ratio Prot		c0.24	0.22		c0.25	
v/s Ratio Perm						0.21
v/c Ratio		0.42	0.38		0.79	0.21
Uniform Delay, d1		11.4	11.0		31.1	0.0
Progression Factor		1.56	1.05		1.00	1.00
Incremental Delay, d2		0.4	0.5		7.5	0.3
Delay (s)		18.2	12.1		38.5	0.3
Level of Service		B	B		D	A
Approach Delay (s)		18.2	12.1		22.4	
Approach LOS		B	B		C	

Intersection Summary			
Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	160	138	127	1008	1245	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.20	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	375	3610	3610	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	167	144	132	1050	1297	147
RTOR Reduction (vph)	0	98	0	0	0	28
Lane Group Flow (vph)	167	46	132	1050	1297	119
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	10.3	10.3	81.2	81.2	81.2	81.2
Effective Green, g (s)	10.3	10.3	81.2	81.2	81.2	81.2
Actuated g/C Ratio	0.10	0.10	0.81	0.81	0.81	0.81
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	360	166	304	2931	2931	1311
v/s Ratio Prot	c0.05			0.29	c0.36	
v/s Ratio Perm		0.03	0.35			0.07
v/c Ratio	0.46	0.28	0.43	0.36	0.44	0.09
Uniform Delay, d1	42.2	41.4	2.7	2.5	2.8	1.9
Progression Factor	1.41	2.15	0.73	0.74	3.40	9.28
Incremental Delay, d2	0.9	0.9	4.2	0.3	0.4	0.1
Delay (s)	60.7	90.0	6.2	2.2	9.8	17.8
Level of Service	E	F	A	A	A	B
Approach Delay (s)	74.3			2.6	10.6	
Approach LOS	E			A	B	

Intersection Summary			
Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	250	38	298	172	4	1	2	74	5	21	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3539		1805	3598		1805	1624			1796	
Flt Permitted	0.61	1.00		0.51	1.00		0.72	1.00			0.98	
Satd. Flow (perm)	1158	3539		974	3598		1374	1624			1769	
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)	3	325	49	387	223	5	1	3	96	6	27	19
RTOR Reduction (vph)	0	20	0	0	2	0	0	60	0	0	12	0
Lane Group Flow (vph)	3	354	0	387	226	0	1	39	0	0	40	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)	53.6	53.6		53.6	53.6		37.9	37.9			37.9	
Effective Green, g (s)	53.6	53.6		53.6	53.6		37.9	37.9			37.9	
Actuated g/C Ratio	0.54	0.54		0.54	0.54		0.38	0.38			0.38	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	620	1896		522	1928		520	615			670	
v/s Ratio Prot		0.10			0.06			c0.02				
v/s Ratio Perm	0.00			c0.40			0.00				0.02	
v/c Ratio	0.00	0.19		0.74	0.12		0.00	0.06			0.06	
Uniform Delay, d1	10.8	12.0		17.9	11.5		19.3	19.8			19.7	
Progression Factor	1.28	1.25		0.92	0.93		0.79	0.59			1.00	
Incremental Delay, d2	0.0	0.0		5.6	0.0		0.0	0.2			0.2	
Delay (s)	13.8	15.0		22.0	10.7		15.3	11.8			19.9	
Level of Service	B	B		C	B		B	B			B	
Approach Delay (s)		15.0			17.8			11.8			19.9	
Approach LOS		B			B			B			B	

Intersection Summary			
Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1270	978	693	1338	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1366	1052	745	1439	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1366	1052	745	1439	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	42.5	100.0	46.4	100.0		
Effective Green, g (s)	42.5	100.0	46.4	100.0		
Actuated g/C Ratio	0.42	1.00	0.46	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	1534	1615	837	3610		
v/s Ratio Prot	c0.38		c0.41	0.40		
v/s Ratio Perm		0.65				
v/c Ratio	0.89	0.65	0.89	0.40		
Uniform Delay, d1	26.6	0.0	24.5	0.0		
Progression Factor	0.86	1.00	0.84	1.00		
Incremental Delay, d2	8.2	2.1	13.4	0.3		
Delay (s)	31.0	2.1	33.8	0.3		
Level of Service	C	A	C	A		
Approach Delay (s)	18.4			11.7	0.0	
Approach LOS	B			B	A	

Intersection Summary			
Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1270	0	0	1350	0	0	0	701	0	0	681
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0				4.0			4.0
Lane Util. Factor		0.95			0.95				0.88			1.00
Frt		1.00			1.00				0.85			0.86
Flt Protected		1.00			1.00				1.00			1.00
Satd. Flow (prot)		3610			3610				2842			1644
Flt Permitted		1.00			1.00				1.00			1.00
Satd. Flow (perm)		3610			3610				2842			1644
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	1309	0	0	1392	0	0	0	723	0	0	702
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	18	0	0	12
Lane Group Flow (vph)	0	1309	0	0	1392	0	0	0	705	0	0	690
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Actuated Green, G (s)		46.2			46.2				44.8			44.8
Effective Green, g (s)		46.2			46.2				44.8			44.8
Actuated g/C Ratio		0.46			0.46				0.45			0.45
Clearance Time (s)		5.0			5.0				4.0			4.0
Vehicle Extension (s)		4.5			4.5				3.0			3.0
Lane Grp Cap (vph)		1667			1667				1273			736
v/s Ratio Prot		0.36			c0.39				0.25			c0.42
v/s Ratio Perm												
v/c Ratio		0.79			0.84				0.55			0.94
Uniform Delay, d1		22.7			23.6				20.3			26.3
Progression Factor		1.06			0.80				1.00			1.00
Incremental Delay, d2		1.7			4.7				0.5			19.3
Delay (s)		25.7			23.6				20.8			45.5
Level of Service		C			C				C			D
Approach Delay (s)		25.7			23.6			20.8			45.5	
Approach LOS		C			C			C			D	

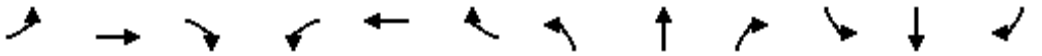
Intersection Summary			
Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1926	44	33	1333	17	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.92	
Flt Protected	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)	3610	1615	1805	3610	1718	
Flt Permitted	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (perm)	3610	1615	1805	3610	1718	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2093	48	36	1449	18	23
RTOR Reduction (vph)	0	2	0	0	22	0
Lane Group Flow (vph)	2093	46	36	1449	19	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	81.3	81.3	3.5	87.8	4.7	
Effective Green, g (s)	81.3	81.3	3.5	87.8	4.7	
Actuated g/C Ratio	0.81	0.81	0.04	0.88	0.05	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2934	1312	63	3169	80	
v/s Ratio Prot	c0.58		c0.02	0.40	c0.01	
v/s Ratio Perm		0.03				
v/c Ratio	0.71	0.03	0.57	0.46	0.24	
Uniform Delay, d1	4.2	1.8	47.5	1.2	45.9	
Progression Factor	1.47	1.13	1.27	0.68	1.00	
Incremental Delay, d2	1.3	0.0	6.5	0.4	1.5	
Delay (s)	7.4	2.1	66.8	1.3	47.5	
Level of Service	A	A	E	A	D	
Approach Delay (s)	7.3			2.8	47.5	
Approach LOS	A			A	D	

Intersection Summary			
Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

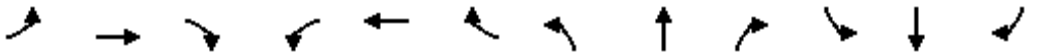
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	1692	20	84	1041	6	97	66	364	26	22	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
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)	207	1839	22	91	1132	7	105	72	396	28	24	171
RTOR Reduction (vph)	0	0	10	0	0	3	0	0	61	0	0	156
Lane Group Flow (vph)	207	1839	12	91	1132	4	105	72	335	28	24	15
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	16.5	55.8	55.8	10.9	50.2	50.2	8.3	14.5	25.4	2.8	9.0	9.0
Effective Green, g (s)	16.5	55.8	55.8	10.9	50.2	50.2	8.3	14.5	25.4	2.8	9.0	9.0
Actuated g/C Ratio	0.16	0.56	0.56	0.11	0.50	0.50	0.08	0.14	0.25	0.03	0.09	0.09
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	297	2014	901	196	1812	810	149	275	410	50	324	145
v/s Ratio Prot	c0.11	c0.51		0.05	0.31		c0.06	0.04	c0.09	0.02	0.01	
v/s Ratio Perm			0.01			0.00			0.12			0.01
v/c Ratio	0.70	0.91	0.01	0.46	0.62	0.00	0.70	0.26	0.82	0.56	0.07	0.11
Uniform Delay, d1	39.4	19.9	9.8	41.8	18.1	12.4	44.7	38.0	35.1	48.0	41.7	41.8
Progression Factor	1.14	0.86	1.00	1.10	0.47	1.00	1.00	1.00	1.00	0.90	0.99	1.76
Incremental Delay, d2	4.3	6.2	0.0	0.6	1.5	0.0	11.7	0.9	11.3	8.3	0.2	0.6
Delay (s)	49.3	23.3	9.9	46.6	10.1	12.4	56.3	38.9	46.4	51.7	41.3	74.0
Level of Service	D	C	A	D	B	B	E	D	D	D	D	E
Approach Delay (s)		25.7			12.8			47.3			67.7	
Approach LOS		C			B			D			E	

Intersection Summary				
Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	83.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



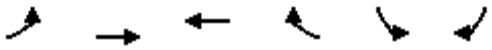
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	1956	264	41	1028	7	68	21	14	23	101	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1806		1805	1900	1615
Flt Permitted	0.21	1.00	1.00	0.06	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	403	3610	1615	113	3610	1615		1806		1805	1900	1615
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)	63	2126	287	45	1117	8	74	23	15	25	110	14
RTOR Reduction (vph)	0	0	53	0	0	3	0	7	0	0	0	12
Lane Group Flow (vph)	63	2126	234	45	1117	5	0	105	0	25	110	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	67.3	67.3	67.3	67.3	67.3	67.3		11.1		11.1	11.1	11.1
Effective Green, g (s)	67.3	67.3	67.3	67.3	67.3	67.3		11.1		11.1	11.1	11.1
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.67	0.67		0.11		0.11	0.11	0.11
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	271	2429	1086	76	2429	1086		200		200	210	179
v/s Ratio Prot		c0.59			0.31			c0.06		0.01	c0.06	
v/s Ratio Perm	0.16		0.14	0.40		0.00						0.00
v/c Ratio	0.23	0.88	0.22	0.59	0.46	0.00		0.52		0.12	0.52	0.01
Uniform Delay, d1	6.3	13.0	6.3	8.9	7.7	5.4		42.0		40.1	42.0	39.6
Progression Factor	1.72	1.46	2.40	1.30	0.82	1.00		1.00		0.87	0.84	1.00
Incremental Delay, d2	1.1	2.8	0.3	24.7	0.5	0.0		2.5		0.3	2.1	0.0
Delay (s)	12.1	21.7	15.2	36.3	6.8	5.4		44.4		35.2	37.4	39.6
Level of Service	B	C	B	D	A	A		D		D	D	D
Approach Delay (s)		20.7			8.0			44.4			37.2	
Approach LOS		C			A			D			D	

Intersection Summary				
Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	73.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1341	522	265	1088	23	94	5	87	23	7	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.88	
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)	1805	3610	1615	1805	3610	1615	3502	1629		1805	1664	
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)	1805	3610	1615	1805	3610	1615	3502	1629		1805	1664	
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)	25	1458	567	288	1183	25	102	5	95	25	8	39
RTOR Reduction (vph)	0	0	126	0	0	13	0	64	0	0	35	0
Lane Group Flow (vph)	25	1458	441	288	1183	12	102	36	0	25	12	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	2.0	35.6	35.6	13.0	46.6	46.6	24.0	32.4		2.0	10.4	
Effective Green, g (s)	2.0	35.6	35.6	13.0	46.6	46.6	24.0	32.4		2.0	10.4	
Actuated g/C Ratio	0.02	0.36	0.36	0.13	0.47	0.47	0.24	0.32		0.02	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	4.5		3.0	3.0	
Lane Grp Cap (vph)	36	1285	574	234	1682	752	840	527		36	173	
v/s Ratio Prot	0.01	c0.40		c0.16	0.33		c0.03	c0.02		c0.01	0.01	
v/s Ratio Perm			0.27			0.01						
v/c Ratio	0.69	1.13	0.77	1.23	0.70	0.02	0.12	0.07		0.69	0.07	
Uniform Delay, d1	48.7	32.2	28.5	43.5	21.2	14.4	29.7	23.4		48.7	40.4	
Progression Factor	1.33	0.83	0.67	1.24	0.39	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	24.4	65.8	4.8	131.6	2.1	0.0	0.3	0.2		44.9	0.2	
Delay (s)	89.3	92.5	24.0	185.6	10.4	14.4	30.0	23.6		93.6	40.6	
Level of Service	F	F	C	F	B	B	C	C		F	D	
Approach Delay (s)		73.5			44.2			26.9			59.0	
Approach LOS		E			D			C			E	

Intersection Summary				
Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

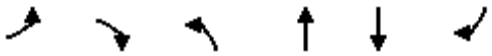


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	58	1393	1224	0	987	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.15	1.00	1.00		0.95	1.00
Satd. Flow (perm)	277	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	60	1436	1262	0	1018	158
RTOR Reduction (vph)	0	0	0	0	0	34
Lane Group Flow (vph)	60	1436	1262	0	1018	124
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	58.5	58.5	58.5		34.0	34.0
Effective Green, g (s)	58.5	58.5	58.5		34.0	34.0
Actuated g/C Ratio	0.58	0.58	0.58		0.34	0.34
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	162	2111	2111		1190	549
v/s Ratio Prot		c0.40	0.35		c0.29	
v/s Ratio Perm	0.22					0.08
v/c Ratio	0.37	0.68	0.60		0.86	0.23
Uniform Delay, d1	11.0	14.3	13.2		30.7	23.6
Progression Factor	0.69	0.68	1.15		0.99	1.37
Incremental Delay, d2	1.5	0.4	1.1		5.7	0.2
Delay (s)	9.1	10.2	16.4		36.2	32.4
Level of Service	A	B	B		D	C
Approach Delay (s)		10.2	16.4		35.6	
Approach LOS		B	B		D	

Intersection Summary			
Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1877	492	63	1825	254	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	109	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2040	535	68	1984	276	108
RTOR Reduction (vph)	0	54	0	0	0	23
Lane Group Flow (vph)	2040	481	68	1984	276	85
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	75.0	75.0	75.0	75.0	16.0	16.0
Effective Green, g (s)	75.0	75.0	75.0	75.0	16.0	16.0
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.16	0.16
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2707	1211	81	3890	560	258
v/s Ratio Prot	0.57			0.38	c0.08	
v/s Ratio Perm		0.30	c0.63			0.05
v/c Ratio	0.75	0.40	0.84	0.51	0.49	0.33
Uniform Delay, d1	7.2	4.5	8.4	5.1	38.3	37.3
Progression Factor	1.79	1.80	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.7	62.4	0.5	3.1	3.4
Delay (s)	14.3	8.7	70.8	5.5	41.4	40.7
Level of Service	B	A	E	A	D	D
Approach Delay (s)	13.2			7.7	41.2	
Approach LOS	B			A	D	

Intersection Summary			
Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	235	13	15	898	1127	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1805	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1805	1615	1805	3610	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	14	16	945	1186	231
RTOR Reduction (vph)	0	11	0	0	0	78
Lane Group Flow (vph)	247	3	16	945	1186	153
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	18.9	18.9	2.7	73.1	66.4	66.4
Effective Green, g (s)	18.9	18.9	2.7	73.1	66.4	66.4
Actuated g/C Ratio	0.19	0.19	0.03	0.73	0.66	0.66
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)	341	305	48	2638	2397	1072
v/s Ratio Prot	c0.14		0.01	c0.26	c0.33	
v/s Ratio Perm		0.00				0.09
v/c Ratio	0.72	0.01	0.33	0.36	0.49	0.14
Uniform Delay, d1	38.1	32.9	47.8	4.9	8.4	6.2
Progression Factor	1.00	1.00	1.11	0.86	0.90	0.77
Incremental Delay, d2	7.4	0.0	3.6	0.3	0.7	0.3
Delay (s)	45.5	33.0	56.6	4.6	8.2	5.1
Level of Service	D	C	E	A	A	A
Approach Delay (s)	44.9			5.4	7.7	
Approach LOS	D			A	A	

Intersection Summary			
Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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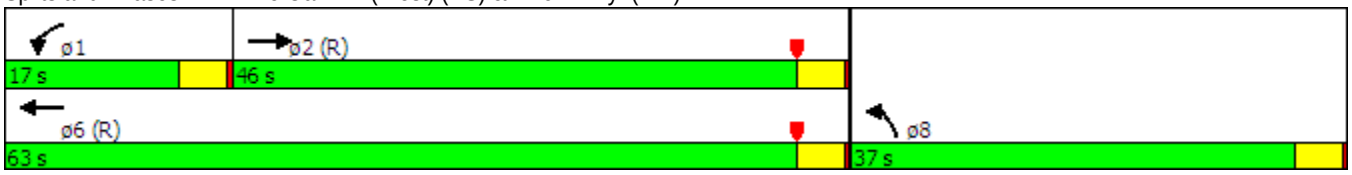
APPENDIX K:

INTERIM YEAR (2017) WITHOUT PROJECT CONDITIONS INTERSECTION ANALYSIS WORKSHEETS

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	587	0	259	1707	943	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	46.0		17.0	63.0	37.0	
Total Split (%)	46.0%		17.0%	63.0%	37.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	587	0	259	1707	943	252
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	638	0	282	1855	1025	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1684	0	347	2185	1105	508
Arrive On Green	0.47	0.00	0.20	1.00	0.31	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	638	0	282	1855	1025	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	11.5	0.0	7.7	0.0	28.3	0.0
Cycle Q Clear(g_c), s	11.5	0.0	7.7	0.0	28.3	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1684	0	347	2185	1105	508
V/C Ratio(X)	0.38	0.00	0.81	0.85	0.93	0.00
Avail Cap(c_a), veh/h	1684	0	456	2185	1158	533
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.3	0.0	39.2	0.0	33.2	0.0
Incr Delay (d2), s/veh	0.7	0.0	6.8	4.4	12.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	5.8	0.0	4.0	1.3	15.6	0.0
LnGrp Delay(d),s/veh	17.9	0.0	46.0	4.4	45.5	0.0
LnGrp LOS	B		D	A	D	
Approach Vol, veh/h	638			2137	1025	
Approach Delay, s/veh	17.9			9.9	45.5	
Approach LOS	B			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.9	50.6				64.5		35.5
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	13.0	42.0				59.0		33.0
Max Q Clear Time (g_c+I1), s	9.7	13.5				2.0		30.3
Green Ext Time (p_c), s	0.2	26.9				51.2		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	20.8
HCM 2010 LOS	C

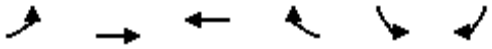
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	294	532	1886	660	192	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	17.0	69.5	52.5	52.5	30.5	30.5
Total Split (%)	17.0%	69.5%	52.5%	52.5%	30.5%	30.5%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	294	532	1886	660	192	124
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	320	578	2050	717	209	135
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	253	2831	2217	992	389	179
Arrive On Green	0.28	1.00	1.00	1.00	0.11	0.11
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	320	578	2050	717	209	135
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	14.0	0.0	0.0	0.0	5.6	8.1
Cycle Q Clear(g_c), s	14.0	0.0	0.0	0.0	5.6	8.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	253	2831	2217	992	389	179
V/C Ratio(X)	1.26	0.20	0.92	0.72	0.54	0.75
Avail Cap(c_a), veh/h	253	2831	2217	992	913	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.57	0.57	1.00	1.00
Uniform Delay (d), s/veh	36.0	0.0	0.0	0.0	42.0	43.1
Incr Delay (d2), s/veh	146.1	0.2	5.0	2.7	1.2	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	17.2	0.1	1.5	0.7	2.8	7.4
LnGrp Delay(d),s/veh	182.1	0.2	5.0	2.7	43.2	49.4
LnGrp LOS	F	A	A	A	D	D
Approach Vol, veh/h		898	2767		344	
Approach Delay, s/veh		65.0	4.4		45.6	
Approach LOS		E	A		D	

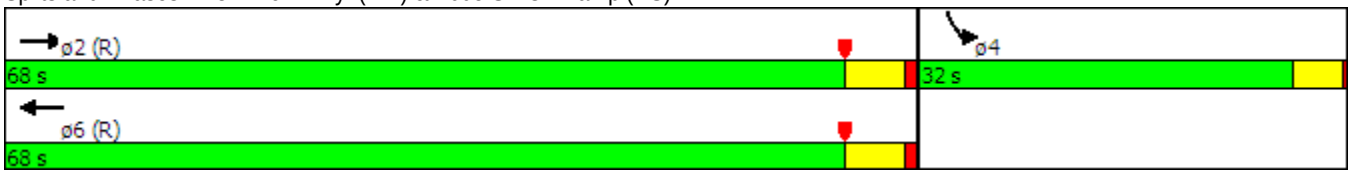
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		84.4		15.6	17.0	67.4		
Change Period (Y+Rc), s		6.0		4.5	3.0	6.0		
Max Green Setting (Gmax), s		63.5		26.0	14.0	46.5		
Max Q Clear Time (g_c+I1), s		2.0		10.1	16.0	2.0		
Green Ext Time (p_c), s		59.7		1.0	0.0	43.5		

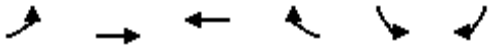
Intersection Summary	
HCM 2010 Ctrl Delay	21.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	714	1889	0	395	652
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		68.0	68.0		32.0	
Total Split (%)		68.0%	68.0%		32.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

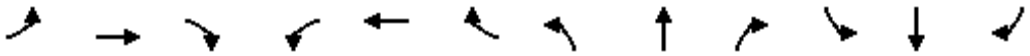




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	714	1889	0	395	652
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	760	2010	0	420	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	3387	2357	0	454	406
Arrive On Green	0.00	1.00	0.65	0.00	0.25	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	760	2010	0	420	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	43.6	0.0	22.6	0.0
Cycle Q Clear(g_c), s	0.0	0.0	43.6	0.0	22.6	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	3387	2357	0	454	406
V/C Ratio(X)	0.00	0.22	0.85	0.00	0.92	0.00
Avail Cap(c_a), veh/h	0	3387	2357	0	505	451
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.97	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	13.6	0.0	36.5	0.0
Incr Delay (d2), s/veh	0.0	0.1	4.2	0.0	21.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.0	22.9	0.0	14.1	0.0
LnGrp Delay(d),s/veh	0.0	0.1	17.8	0.0	58.3	0.0
LnGrp LOS		A	B		E	
Approach Vol, veh/h		760	2010		420	
Approach Delay, s/veh		0.1	17.8		58.3	
Approach LOS		A	B		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		70.8		29.2		70.8		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		62.5		27.9		62.5		
Max Q Clear Time (g_c+I1), s		2.0		24.6		45.6		
Green Ext Time (p_c), s		60.2		0.5		16.9		

Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	729	30	0	1889	319	0	0	31	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	729	30	0	1889	319	0	0	31	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	759	31	0	1968	332	0	0	32	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1968	0	0	759	0	0	1743	2727	380
Stage 1	-	-	-	-	-	-	759	759	-
Stage 2	-	-	-	-	-	-	984	1968	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	299	-	-	862	-	0	79	21	624
Stage 1	-	-	-	-	-	0	428	418	-
Stage 2	-	-	-	-	-	0	327	110	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	299	-	-	862	-	-	79	0	624
Mov Cap-2 Maneuver	-	-	-	-	-	-	79	0	-
Stage 1	-	-	-	-	-	-	428	0	-
Stage 2	-	-	-	-	-	-	327	0	-

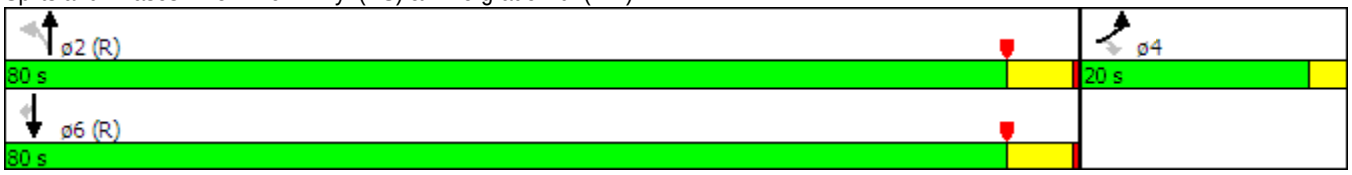
Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	624	299	-	-	862	-
HCM Lane V/C Ratio	0.052	-	-	-	-	-
HCM Control Delay (s)	11.1	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	236	12	21	2016	511	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			931	1292	
Travel Time (s)	15.2			14.1	19.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	20.0	20.0	80.0	80.0	80.0	80.0
Total Split (%)	20.0%	20.0%	80.0%	80.0%	80.0%	80.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	236	12	21	2016	511	305
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	257	13	23	2191	555	332
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	340	156	572	2954	2954	1322
Arrive On Green	0.10	0.10	0.82	0.82	0.82	0.82
Sat Flow, veh/h	3510	1615	636	3705	3705	1615
Grp Volume(v), veh/h	257	13	23	2191	555	332
Grp Sat Flow(s),veh/h/ln	1755	1615	636	1805	1805	1615
Q Serve(g_s), s	7.1	0.7	0.8	28.1	3.3	4.7
Cycle Q Clear(g_c), s	7.1	0.7	4.1	28.1	3.3	4.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	340	156	572	2954	2954	1322
V/C Ratio(X)	0.76	0.08	0.04	0.74	0.19	0.25
Avail Cap(c_a), veh/h	597	275	572	2954	2954	1322
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.0	41.1	2.4	4.2	2.0	2.1
Incr Delay (d2), s/veh	3.4	0.2	0.1	1.7	0.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.6	0.3	0.2	14.1	1.7	2.2
LnGrp Delay(d),s/veh	47.4	41.3	2.5	5.9	2.1	2.5
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	270			2214	887	
Approach Delay, s/veh	47.1			5.9	2.3	
Approach LOS	D			A	A	

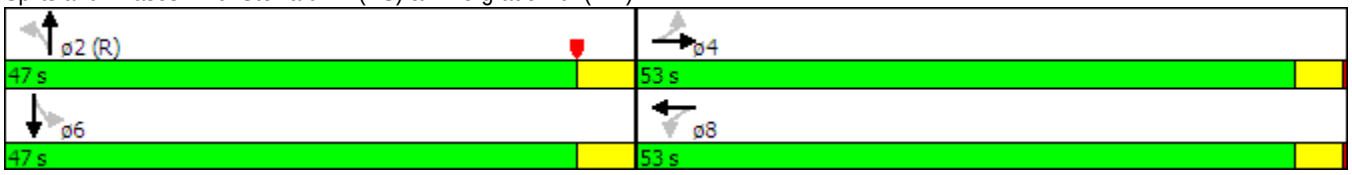
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		87.3		12.7		87.3		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		74.5		17.0		74.5		
Max Q Clear Time (g_c+I1), s		30.1		9.1		6.7		
Green Ext Time (p_c), s		31.6		0.5		41.5		

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	116	10	95	266	11	10	9	88	7	6	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	53.0	53.0		53.0	53.0		47.0	47.0		47.0	47.0	
Total Split (%)	53.0%	53.0%		53.0%	53.0%		47.0%	47.0%		47.0%	47.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	116	10	95	266	11	10	9	88	7	6	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	26	130	11	107	299	12	11	10	99	8	7	16
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	166	554	46	237	581	23	1133	113	1116	326	294	614
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1085	3373	282	1267	3538	142	1410	150	1487	375	392	818
Grp Volume(v), veh/h	26	69	72	107	152	159	11	0	109	31	0	0
Grp Sat Flow(s),veh/h/ln	1085	1805	1850	1267	1805	1875	1410	0	1638	1585	0	0
Q Serve(g_s), s	2.2	3.3	3.4	8.0	7.7	7.7	0.0	0.0	1.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	10.0	3.3	3.4	11.4	7.7	7.7	0.2	0.0	1.8	0.5	0.0	0.0
Prop In Lane	1.00		0.15	1.00		0.08	1.00		0.91	0.26		0.52
Lane Grp Cap(c), veh/h	166	297	304	237	297	308	1133	0	1229	1235	0	0
V/C Ratio(X)	0.16	0.23	0.24	0.45	0.51	0.52	0.01	0.00	0.09	0.03	0.00	0.00
Avail Cap(c_a), veh/h	520	884	907	650	884	919	1133	0	1229	1235	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	0.98	0.98	0.98	0.63	0.00	0.63	1.00	0.00	0.00
Uniform Delay (d), s/veh	42.7	36.3	36.3	41.3	38.1	38.2	3.1	0.0	3.3	3.2	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.4	0.4	1.3	1.3	1.3	0.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	1.7	1.8	2.9	4.0	4.1	0.1	0.0	0.8	0.2	0.0	0.0
LnGrp Delay(d),s/veh	43.1	36.7	36.7	42.6	39.5	39.5	3.1	0.0	3.4	3.2	0.0	0.0
LnGrp LOS	D	D	D	D	D	D	A		A	A		
Approach Vol, veh/h		167			418			120			31	
Approach Delay, s/veh		37.7			40.3			3.4			3.2	
Approach LOS		D			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		79.6		20.4		79.6		20.4
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		42.5		49.0		42.5		49.0
Max Q Clear Time (g_c+I1), s		3.8		12.0		2.5		13.4
Green Ext Time (p_c), s		0.5		3.0		0.5		3.0

Intersection Summary	
HCM 2010 Ctrl Delay	32.1
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	330	674	699	1551	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	27.0		73.0	100.0		
Total Split (%)	27.0%		73.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



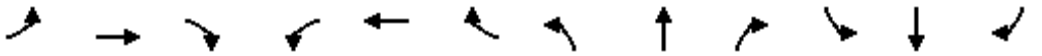
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	330	674	699	1551	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	351	0	744	1650		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.94	0.94	0.94	0.94		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	895	401	1220	3531		
Arrive On Green	0.25	0.00	1.00	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	351	0	744	1650		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	8.1	0.0	0.0	0.0		
Cycle Q Clear(g_c), s	8.1	0.0	0.0	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	895	401	1220	3531		
V/C Ratio(X)	0.39	0.00	0.61	0.47		
Avail Cap(c_a), veh/h	895	401	1220	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	31.3	0.0	0.0	0.0		
Incr Delay (d2), s/veh	1.3	0.0	2.3	0.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	4.2	0.0	0.8	0.2		
LnGrp Delay(d),s/veh	32.6	0.0	2.3	0.4		
LnGrp LOS	C		A	A		
Approach Vol, veh/h	351			2394		
Approach Delay, s/veh	32.6			1.0		
Approach LOS	C			A		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	73.0	30.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	67.4	* 22				94.4		
Max Q Clear Time (g_c+I1), s	2.0	10.1				2.0		
Green Ext Time (p_c), s	8.2	10.5				59.8		

Intersection Summary	
HCM 2010 Ctrl Delay	5.1
HCM 2010 LOS	A

Notes

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	330	0	0	1505	0	0	0	674	0	0	745
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	139.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	330	0	0	1505	0	0	0	674	0	0	745
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	340	0	0	1552	0	0	0	695	0	0	768

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1552	0	0	340	0	0	1116	1892	170	1722	1892	776
Stage 1	-	-	-	-	-	-	340	340	-	1552	1552	-
Stage 2	-	-	-	-	-	-	776	1552	-	170	340	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	433	-	-	1230	-	-	165	71	851	59	71	~ 345
Stage 1	-	-	-	-	-	-	654	643	-	121	176	-
Stage 2	-	-	-	-	-	-	361	176	-	821	643	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	433	-	-	1230	-	-	-	71	851	11	71	~ 345
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	71	-	11	71	-
Stage 1	-	-	-	-	-	-	654	643	-	121	176	-
Stage 2	-	-	-	-	-	-	-	176	-	151	643	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	25	$ 585.6
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	851	433	-	-	1230	-	-	345
HCM Lane V/C Ratio	0.817	-	-	-	-	-	-	2.226
HCM Control Delay (s)	25	0	-	-	0	-	-	$ 585.6
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	9.1	0	-	-	0	-	-	57.9

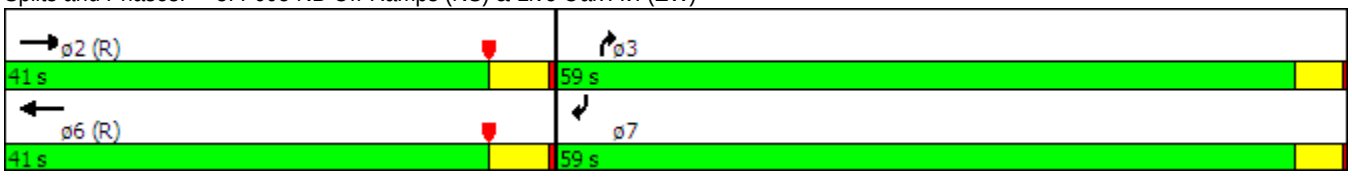
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

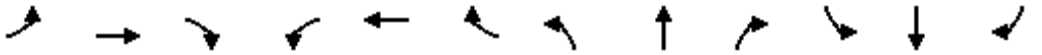
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	330	0	0	1505	0	0	0	674	0	0	745
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Detector Phase		2			6				3			7
Switch Phase												
Minimum Initial (s)		10.0			10.0				4.0			4.0
Minimum Split (s)		21.0			21.0				8.0			8.0
Total Split (s)		41.0			41.0				59.0			59.0
Total Split (%)		41.0%			41.0%				59.0%			59.0%
Yellow Time (s)		4.5			4.5				3.5			3.5
All-Red Time (s)		0.5			0.5				0.5			0.5
Lost Time Adjust (s)		0.0			0.0				0.0			0.0
Total Lost Time (s)		5.0			5.0				4.0			4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max				None			None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 75 (75%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	330	0	0	1505	0	0	0	674	0	0	745
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	0	0	1900	0	0	0	1900	0	0	1900
Adj Flow Rate, veh/h	0	340	0	0	1552	0	0	0	695	0	0	768
Adj No. of Lanes	0	2	0	0	3	0	0	0	2	0	0	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	3430	0	0	4928	0	0	0	0	0	0	0
Arrive On Green	0.00	0.31	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	3800	0	0	5529	0		0			0	
Grp Volume(v), veh/h	0	340	0	0	1552	0		0.0			0.0	
Grp Sat Flow(s),veh/h/ln	0	1805	0	0	1729	0						
Q Serve(g_s), s	0.0	6.7	0.0	0.0	0.0	0.0						
Cycle Q Clear(g_c), s	0.0	6.7	0.0	0.0	0.0	0.0						
Prop In Lane	0.00		0.00	0.00		0.00						
Lane Grp Cap(c), veh/h	0	3430	0	0	4928	0						
V/C Ratio(X)	0.00	0.10	0.00	0.00	0.31	0.00						
Avail Cap(c_a), veh/h	0	3430	0	0	4928	0						
HCM Platoon Ratio	1.00	0.33	1.00	1.00	2.00	1.00						
Upstream Filter(I)	0.00	0.89	0.00	0.00	0.80	0.00						
Uniform Delay (d), s/veh	0.0	4.0	0.0	0.0	0.0	0.0						
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(-26165%),veh/ln	0.0	3.4	0.0	0.0	0.1	0.0						
LnGrp Delay(d),s/veh	0.0	4.1	0.0	0.0	0.1	0.0						
LnGrp LOS		A			A							
Approach Vol, veh/h		340			1552							
Approach Delay, s/veh		4.1			0.1							
Approach LOS		A			A							

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		
Phs Duration (G+Y+Rc), s		100.0				100.0		
Change Period (Y+Rc), s		5.0				5.0		
Max Green Setting (Gmax), s		36.0				36.0		
Max Q Clear Time (g_c+I1), s		8.7				2.0		
Green Ext Time (p_c), s		21.1				25.0		

Intersection Summary	
HCM 2010 Ctrl Delay	0.8
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	899	105	47	1354	151	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	59.0	59.0	12.0	71.0	29.0	
Total Split (%)	59.0%	59.0%	12.0%	71.0%	29.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 96 (96%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



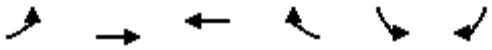
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	899	105	47	1354	151	57
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	977	114	51	1472	164	62
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2554	1143	66	2794	191	72
Arrive On Green	0.47	0.47	0.02	0.52	0.15	0.15
Sat Flow, veh/h	3705	1615	1810	3705	1266	479
Grp Volume(v), veh/h	977	114	51	1472	227	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1752	0
Q Serve(g_s), s	17.4	3.9	2.8	27.0	12.6	0.0
Cycle Q Clear(g_c), s	17.4	3.9	2.8	27.0	12.6	0.0
Prop In Lane		1.00	1.00		0.72	0.27
Lane Grp Cap(c), veh/h	2554	1143	66	2794	265	0
V/C Ratio(X)	0.38	0.10	0.77	0.53	0.86	0.00
Avail Cap(c_a), veh/h	2554	1143	163	2794	456	0
HCM Platoon Ratio	0.67	0.67	0.67	0.67	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.3	8.7	48.4	11.9	41.4	0.0
Incr Delay (d2), s/veh	0.4	0.2	7.0	0.7	7.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	8.8	1.8	1.5	13.8	6.7	0.0
LnGrp Delay(d),s/veh	12.7	8.9	55.4	12.7	49.3	0.0
LnGrp LOS	B	A	E	B	D	
Approach Vol, veh/h	1091			1523	227	
Approach Delay, s/veh	12.3			14.1	49.3	
Approach LOS	B			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.6	75.3				81.9		18.1
Change Period (Y+Rc), s	3.0	4.5				4.5		3.0
Max Green Setting (Gmax), s	9.0	54.5				66.5		26.0
Max Q Clear Time (g_c+I1), s	4.8	19.4				29.0		14.6
Green Ext Time (p_c), s	0.0	30.0				31.7		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Notes

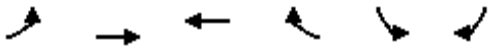
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	85	876	1289	54	13	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	85	876	1289	54	13	131
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	89	922	1357	57	14	138
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.77				0.84	0.77
vC, conflicting volume	1414				1997	678
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	937				1040	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				92	84
cM capacity (veh/h)	569				162	839

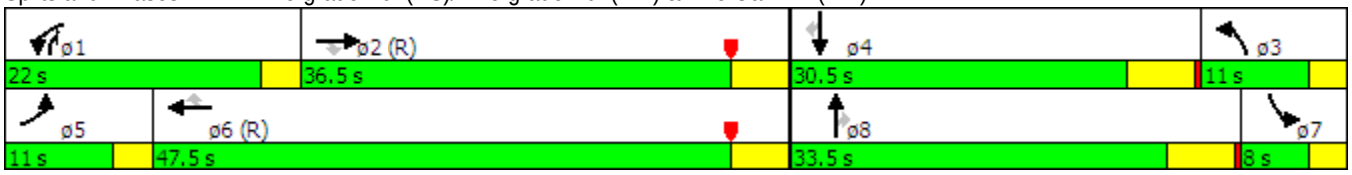
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	89	461	461	678	678	57	152
Volume Left	89	0	0	0	0	0	14
Volume Right	0	0	0	0	0	57	138
cSH	569	1700	1700	1700	1700	1700	609
Volume to Capacity	0.16	0.27	0.27	0.40	0.40	0.03	0.25
Queue Length 95th (ft)	14	0	0	0	0	0	24
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	0.0	12.9
Lane LOS	B						B
Approach Delay (s)	1.1			0.0			12.9
Approach LOS							B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	701	90	256	1205	13	51	50	106	30	75	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	11.0	36.5	36.5	22.0	47.5	47.5	11.0	33.5	22.0	8.0	30.5	30.5
Total Split (%)	11.0%	36.5%	36.5%	22.0%	47.5%	47.5%	11.0%	33.5%	22.0%	8.0%	30.5%	30.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	91	701	90	256	1205	13	51	50	106	30	75	71
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	99	762	0	278	1310	14	55	54	115	33	82	77
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	126	2039	912	303	2393	1070	71	145	394	56	246	110
Arrive On Green	0.02	0.19	0.00	0.34	1.00	1.00	0.04	0.08	0.08	0.03	0.07	0.07
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	99	762	0	278	1310	14	55	54	115	33	82	77
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	5.4	18.5	0.0	14.7	0.0	0.0	3.0	2.7	4.7	1.8	2.2	3.9
Cycle Q Clear(g_c), s	5.4	18.5	0.0	14.7	0.0	0.0	3.0	2.7	4.7	1.8	2.2	3.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	126	2039	912	303	2393	1070	71	145	394	56	246	110
V/C Ratio(X)	0.78	0.37	0.00	0.92	0.55	0.01	0.77	0.37	0.29	0.58	0.33	0.70
Avail Cap(c_a), veh/h	145	2039	912	344	2393	1070	145	532	723	90	903	404
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.48	0.48	0.48	1.00	1.00	1.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	48.1	25.2	0.0	32.6	0.0	0.0	47.6	43.9	20.2	47.8	44.4	31.7
Incr Delay (d2), s/veh	18.3	0.5	0.0	14.5	0.4	0.0	6.5	2.7	0.7	2.9	1.1	10.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.4	9.4	0.0	8.5	0.1	0.0	1.6	1.5	2.2	0.9	1.1	2.1
LnGrp Delay(d),s/veh	66.4	25.7	0.0	47.1	0.4	0.0	54.1	46.6	20.9	50.7	45.5	42.3
LnGrp LOS	E	C		D	A	A	D	D	C	D	D	D
Approach Vol, veh/h		861			1602			224			192	
Approach Delay, s/veh		30.4			8.5			35.3			45.1	
Approach LOS		C			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.8	61.0	6.9	12.3	10.0	70.8	6.1	13.1
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	19.0	32.0	8.0	25.0	8.0	43.0	5.0	28.0
Max Q Clear Time (g_c+I1), s	16.7	20.5	5.0	5.9	7.4	2.0	3.8	6.7
Green Ext Time (p_c), s	0.0	10.1	0.0	1.0	0.0	28.5	0.0	1.0

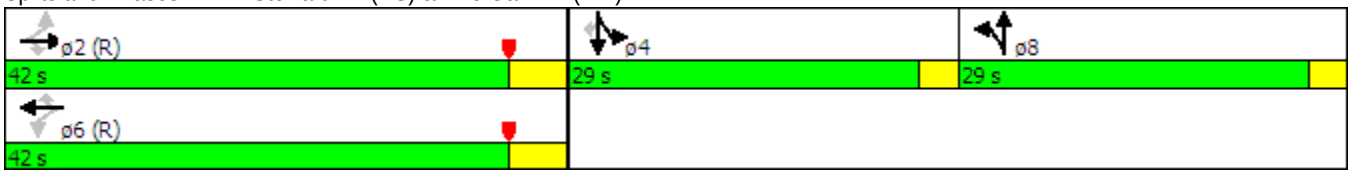
Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	641	31	17	1547	36	224	121	33	13	28	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	641	31	17	1547	36	224	121	33	13	28	78
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	21	697	34	18	1682	39	243	132	36	14	30	85
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	238	2082	932	497	2082	932	264	143	39	132	139	118
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.25	0.25	0.25	0.07	0.07	0.07
Sat Flow, veh/h	287	3610	1615	736	3610	1615	1075	584	159	1810	1900	1615
Grp Volume(v), veh/h	21	697	34	18	1682	39	411	0	0	14	30	85
Grp Sat Flow(s),veh/h/ln	287	1805	1615	736	1805	1615	1818	0	0	1810	1900	1615
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	22.0	0.0	0.0	0.7	1.5	5.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	22.0	0.0	0.0	0.7	1.5	5.2
Prop In Lane	1.00		1.00	1.00		1.00	0.59		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	238	2082	932	497	2082	932	446	0	0	132	139	118
V/C Ratio(X)	0.09	0.33	0.04	0.04	0.81	0.04	0.92	0.00	0.00	0.11	0.22	0.72
Avail Cap(c_a), veh/h	238	2082	932	497	2082	932	473	0	0	470	494	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.77	0.77	0.77	1.00	0.00	0.00	0.90	0.90	0.90
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0	0.0	43.3	43.7	45.4
Incr Delay (d2), s/veh	0.7	0.4	0.1	0.1	2.7	0.1	22.9	0.0	0.0	0.3	0.7	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.1	0.0	0.0	0.8	0.0	13.9	0.0	0.0	0.4	0.8	2.5
LnGrp Delay(d),s/veh	0.7	0.4	0.1	0.1	2.7	0.1	59.8	0.0	0.0	43.6	44.4	52.6
LnGrp LOS	A	A	A	A	A	A	E			D	D	D
Approach Vol, veh/h		752			1739			411			129	
Approach Delay, s/veh		0.4			2.6			59.8			49.7	
Approach LOS		A			A			E			D	

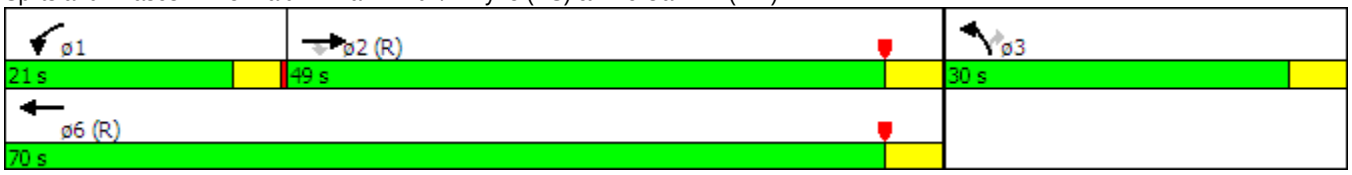
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		62.2		10.3		62.2		27.5
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		2.0		7.2		2.0		24.0
Green Ext Time (p_c), s		16.9		0.4		16.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	540	65	134	1415	305	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	200		100	0
Storage Lanes		1	1		1	1
Taper Length (ft)			60		60	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	1141			511	1039	
Travel Time (s)	17.3			7.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	10.0	10.0
Minimum Split (s)	20.5	20.5	8.0	20.0	20.5	20.5
Total Split (s)	49.0	49.0	21.0	70.0	30.0	30.0
Total Split (%)	49.0%	49.0%	21.0%	70.0%	30.0%	30.0%
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5	4.5
All-Red Time (s)	0.0	0.0	0.5	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.0	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	540	65	134	1415	305	296
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	587	71	146	1538	332	322
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1868	836	177	2365	895	412
Arrive On Green	1.00	1.00	0.20	1.00	0.25	0.25
Sat Flow, veh/h	3705	1615	1810	3705	3510	1615
Grp Volume(v), veh/h	587	71	146	1538	332	322
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1755	1615
Q Serve(g_s), s	0.0	0.0	7.7	0.0	7.8	18.6
Cycle Q Clear(g_c), s	0.0	0.0	7.7	0.0	7.8	18.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1868	836	177	2365	895	412
V/C Ratio(X)	0.31	0.08	0.83	0.65	0.37	0.78
Avail Cap(c_a), veh/h	1868	836	308	2365	895	412
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.81	0.81	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	39.4	0.0	30.6	34.7
Incr Delay (d2), s/veh	0.4	0.2	7.7	1.1	1.2	13.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.1	0.0	4.2	0.4	3.9	9.8
LnGrp Delay(d),s/veh	0.4	0.2	47.2	1.1	31.8	48.4
LnGrp LOS	A	A	D	A	C	D
Approach Vol, veh/h	658			1684	654	
Approach Delay, s/veh	0.4			5.1	40.0	
Approach LOS	A			A	D	

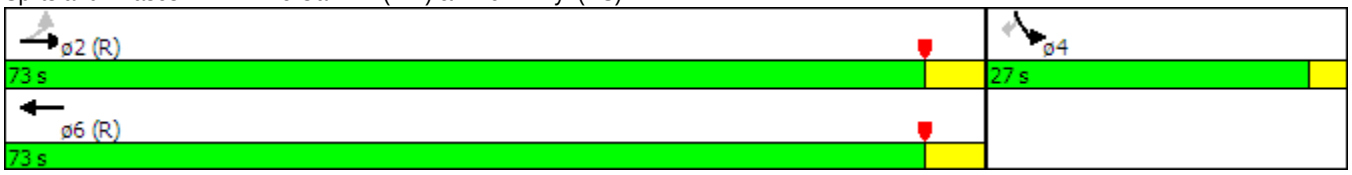
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.8	56.2				70.0		30.0
Change Period (Y+Rc), s	4.0	4.5				4.5		4.5
Max Green Setting (Gmax), s	17.0	44.5				65.5		25.5
Max Q Clear Time (g_c+I1), s	9.7	2.0				2.0		20.6
Green Ext Time (p_c), s	0.2	33.8				46.0		1.9

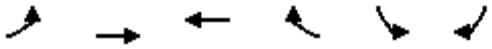
Intersection Summary	
HCM 2010 Ctrl Delay	11.7
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	101	734	1482	0	457	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	20.0	20.0	28.5		27.0	27.0
Total Split (s)	73.0	73.0	73.0		27.0	27.0
Total Split (%)	73.0%	73.0%	73.0%		27.0%	27.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 33 (33%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	101	734	1482	0	457	66
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	104	757	1528	0	471	68
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	275	2751	2751	0	572	263
Arrive On Green	0.51	0.51	0.76	0.00	0.16	0.16
Sat Flow, veh/h	346	3705	3800	0	3510	1615
Grp Volume(v), veh/h	104	757	1528	0	471	68
Grp Sat Flow(s),veh/h/ln	346	1805	1805	0	1755	1615
Q Serve(g_s), s	22.8	11.9	17.5	0.0	13.0	3.7
Cycle Q Clear(g_c), s	40.3	11.9	17.5	0.0	13.0	3.7
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	275	2751	2751	0	572	263
V/C Ratio(X)	0.38	0.28	0.56	0.00	0.82	0.26
Avail Cap(c_a), veh/h	275	2751	2751	0	843	388
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	8.8	4.9	0.0	40.4	36.6
Incr Delay (d2), s/veh	3.6	0.2	0.8	0.0	4.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	2.5	6.0	8.8	0.0	6.6	1.7
LnGrp Delay(d),s/veh	26.0	9.0	5.7	0.0	44.7	37.1
LnGrp LOS	C	A	A		D	D
Approach Vol, veh/h		861	1528		539	
Approach Delay, s/veh		11.0	5.7		43.8	
Approach LOS		B	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		80.7		19.3		80.7		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		68.5		24.0		68.5		
Max Q Clear Time (g_c+I1), s		42.3		15.0		19.5		
Green Ext Time (p_c), s		23.9		1.3		41.8		

Intersection Summary	
HCM 2010 Ctrl Delay	14.3
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	889	114	35	2787	631	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	71.0	71.0	71.0	71.0	29.0	29.0
Total Split (%)	71.0%	71.0%	71.0%	71.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	889	114	35	2787	631	106
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	966	124	38	3029	686	115
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2383	1066	354	3423	878	404
Arrive On Green	0.66	0.66	0.66	0.66	0.25	0.25
Sat Flow, veh/h	3705	1615	526	5358	3510	1615
Grp Volume(v), veh/h	966	124	38	3029	686	115
Grp Sat Flow(s),veh/h/ln	1805	1615	526	1729	1755	1615
Q Serve(g_s), s	12.4	2.8	3.6	47.7	18.2	5.8
Cycle Q Clear(g_c), s	12.4	2.8	16.0	47.7	18.2	5.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2383	1066	354	3423	878	404
V/C Ratio(X)	0.41	0.12	0.11	0.88	0.78	0.28
Avail Cap(c_a), veh/h	2383	1066	354	3423	878	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.9	6.3	11.6	13.9	35.0	30.3
Incr Delay (d2), s/veh	0.5	0.2	0.6	3.8	6.9	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	6.3	1.3	0.6	23.6	9.6	2.8
LnGrp Delay(d),s/veh	8.4	6.5	12.2	17.7	41.8	32.0
LnGrp LOS	A	A	B	B	D	C
Approach Vol, veh/h	1090			3067	801	
Approach Delay, s/veh	8.2			17.6	40.4	
Approach LOS	A			B	D	

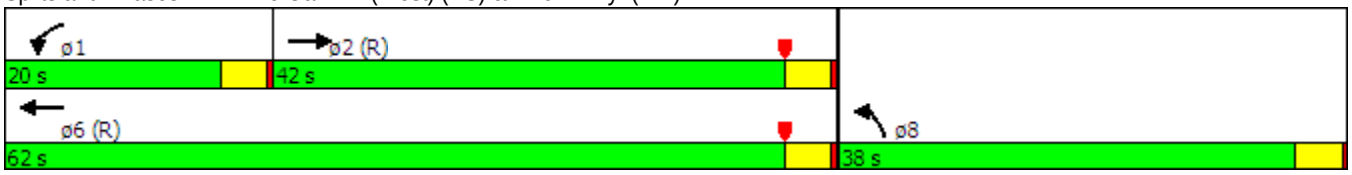
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		71.0				71.0		29.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		66.0				66.0		25.0
Max Q Clear Time (g_c+I1), s		14.4				49.7		20.2
Green Ext Time (p_c), s		51.2				16.2		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	19.2
HCM 2010 LOS	B

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	940	0	378	957	881	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	42.0		20.0	62.0	38.0	
Total Split (%)	42.0%		20.0%	62.0%	38.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	940	0	378	957	881	294
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	1022	0	411	1040	958	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1600	0	473	2230	1061	488
Arrive On Green	0.44	0.00	0.27	1.00	0.30	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	1022	0	411	1040	958	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	22.0	0.0	11.2	0.0	26.2	0.0
Cycle Q Clear(g_c), s	22.0	0.0	11.2	0.0	26.2	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1600	0	473	2230	1061	488
V/C Ratio(X)	0.64	0.00	0.87	0.47	0.90	0.00
Avail Cap(c_a), veh/h	1600	0	562	2230	1194	549
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.6	0.0	35.7	0.0	33.5	0.0
Incr Delay (d2), s/veh	2.0	0.0	11.2	0.7	9.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	11.4	0.0	6.1	0.2	14.0	0.0
LnGrp Delay(d),s/veh	23.6	0.0	46.9	0.7	42.5	0.0
LnGrp LOS	C		D	A	D	
Approach Vol, veh/h	1022			1451	958	
Approach Delay, s/veh	23.6			13.8	42.5	
Approach LOS	C			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	17.5	48.3				65.8		34.2
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	16.0	38.0				58.0		34.0
Max Q Clear Time (g_c+I1), s	13.2	24.0				2.0		28.2
Green Ext Time (p_c), s	0.3	12.8				42.5		2.0

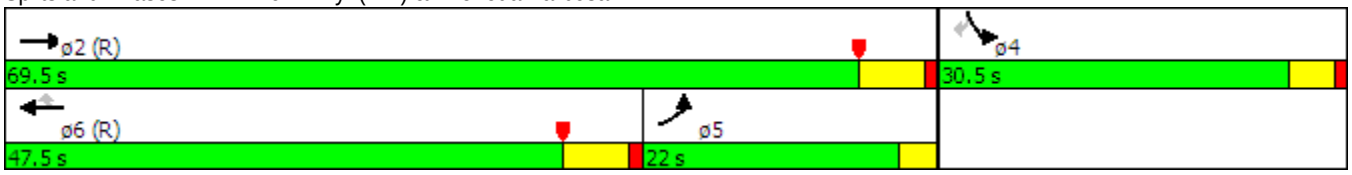
Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

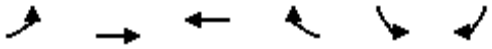
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	192	1028	1053	215	417	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	22.0	69.5	47.5	47.5	30.5	30.5
Total Split (%)	22.0%	69.5%	47.5%	47.5%	30.5%	30.5%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	192	1028	1053	215	417	316
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	209	1117	1145	234	453	343
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	332	2377	1498	670	831	382
Arrive On Green	0.37	1.00	0.83	0.83	0.24	0.24
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	209	1117	1145	234	453	343
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	9.5	0.0	14.7	3.5	11.3	20.6
Cycle Q Clear(g_c), s	9.5	0.0	14.7	3.5	11.3	20.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	332	2377	1498	670	831	382
V/C Ratio(X)	0.63	0.47	0.76	0.35	0.55	0.90
Avail Cap(c_a), veh/h	344	2377	1498	670	913	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.95	0.95	1.00	1.00
Uniform Delay (d), s/veh	28.9	0.0	6.2	5.3	33.5	37.0
Incr Delay (d2), s/veh	2.5	0.7	3.6	1.4	0.6	20.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	4.9	0.2	7.4	1.7	5.5	18.9
LnGrp Delay(d),s/veh	31.4	0.7	9.8	6.6	34.0	57.4
LnGrp LOS	C	A	A	A	C	E
Approach Vol, veh/h		1326	1379		796	
Approach Delay, s/veh		5.5	9.3		44.1	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		71.8		28.2	24.3	47.5		
Change Period (Y+Rc), s		6.0		4.5	6.0	* 6		
Max Green Setting (Gmax), s		63.5		26.0	19.0	* 42		
Max Q Clear Time (g_c+I1), s		2.0		22.6	11.5	16.7		
Green Ext Time (p_c), s		20.8		1.1	4.7	16.1		

Intersection Summary	
HCM 2010 Ctrl Delay	15.8
HCM 2010 LOS	B

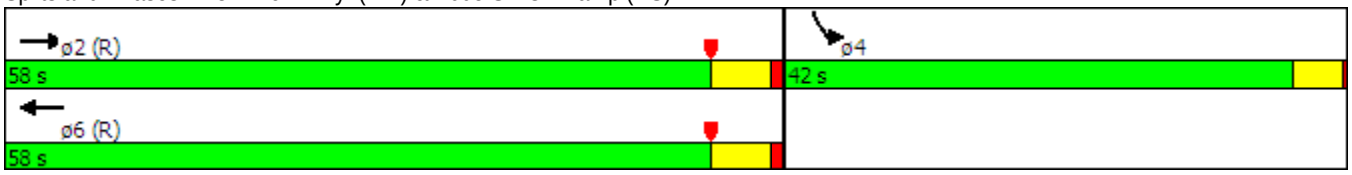
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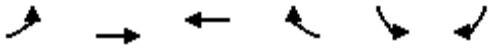
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1435	816	0	297	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		58.0	58.0		42.0	
Total Split (%)		58.0%	58.0%		42.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

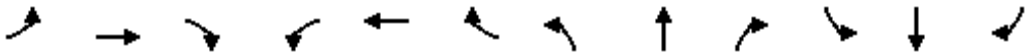




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	1435	816	0	297	438
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	1560	887	0	323	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	3639	2533	0	366	327
Arrive On Green	0.00	1.00	0.70	0.00	0.20	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	1560	887	0	323	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	9.7	0.0	17.3	0.0
Cycle Q Clear(g_c), s	0.0	0.0	9.7	0.0	17.3	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	3639	2533	0	366	327
V/C Ratio(X)	0.00	0.43	0.35	0.00	0.88	0.00
Avail Cap(c_a), veh/h	0	3639	2533	0	686	612
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.85	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	5.9	0.0	38.7	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.4	0.0	7.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.1	4.9	0.0	9.3	0.0
LnGrp Delay(d),s/veh	0.0	0.3	6.3	0.0	45.7	0.0
LnGrp LOS		A	A		D	
Approach Vol, veh/h		1560	887		323	
Approach Delay, s/veh		0.3	6.3		45.7	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		75.7		24.3		75.7		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		52.5		37.9		52.5		
Max Q Clear Time (g_c+I1), s		2.0		19.3		11.7		
Green Ext Time (p_c), s		49.7		0.9		40.3		

Intersection Summary	
HCM 2010 Ctrl Delay	7.5
HCM 2010 LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1445	15	0	816	341	0	0	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1445	15	0	816	341	0	0	33	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1537	16	0	868	363	0	0	35	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	868	0	0	1537	0	0	1971	2405	769
Stage 1	-	-	-	-	-	-	1537	1537	-
Stage 2	-	-	-	-	-	-	434	868	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	785	-	-	438	-	0	56	34	348
Stage 1	-	-	-	-	-	0	167	179	-
Stage 2	-	-	-	-	-	0	627	372	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	785	-	-	438	-	-	56	0	348
Mov Cap-2 Maneuver	-	-	-	-	-	-	56	0	-
Stage 1	-	-	-	-	-	-	167	0	-
Stage 2	-	-	-	-	-	-	627	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.5
HCM LOS			C

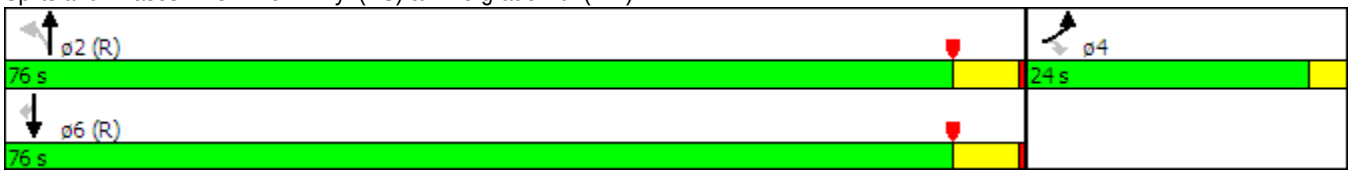
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	348	785	-	-	438	-
HCM Lane V/C Ratio	0.101	-	-	-	-	-
HCM Control Delay (s)	16.5	0	-	-	0	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	159	17	19	975	1220	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			931	1292	
Travel Time (s)	15.2			14.1	19.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	24.0	24.0	76.0	76.0	76.0	76.0
Total Split (%)	24.0%	24.0%	76.0%	76.0%	76.0%	76.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 5 (5%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	159	17	19	975	1220	146
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	166	18	20	1016	1271	152
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	247	114	363	3049	3049	1364
Arrive On Green	0.07	0.07	0.84	0.84	0.84	0.84
Sat Flow, veh/h	3510	1615	383	3705	3705	1615
Grp Volume(v), veh/h	166	18	20	1016	1271	152
Grp Sat Flow(s),veh/h/ln	1755	1615	383	1805	1805	1615
Q Serve(g_s), s	4.6	1.0	1.3	6.1	8.4	1.6
Cycle Q Clear(g_c), s	4.6	1.0	9.8	6.1	8.4	1.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	247	114	363	3049	3049	1364
V/C Ratio(X)	0.67	0.16	0.06	0.33	0.42	0.11
Avail Cap(c_a), veh/h	737	339	363	3049	3049	1364
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.4	43.7	3.0	1.7	1.9	1.3
Incr Delay (d2), s/veh	3.1	0.6	0.3	0.3	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	2.3	0.5	0.2	3.1	4.2	0.8
LnGrp Delay(d),s/veh	48.5	44.3	3.3	2.0	2.3	1.5
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	184			1036	1423	
Approach Delay, s/veh	48.1			2.0	2.2	
Approach LOS	D			A	A	

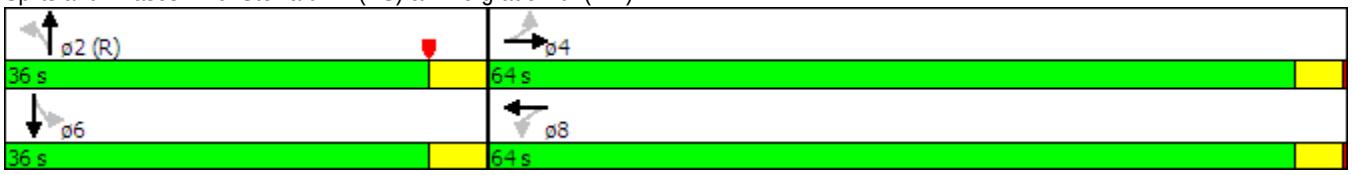
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		90.0		10.0		90.0		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		70.5		21.0		70.5		
Max Q Clear Time (g_c+I1), s		11.8		6.6		10.4		
Green Ext Time (p_c), s		33.2		0.5		33.6		

Intersection Summary	
HCM 2010 Ctrl Delay	5.3
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	135	39	304	68	3	1	2	68	4	21	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	64.0	64.0		64.0	64.0		36.0	36.0		36.0	36.0	
Total Split (%)	64.0%	64.0%		64.0%	64.0%		36.0%	36.0%		36.0%	36.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	135	39	304	68	3	1	2	68	4	21	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	3	175	51	395	88	4	1	3	88	5	27	19
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	599	1147	325	508	1452	66	772	27	789	95	492	325
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.50	0.50	0.50	0.50	0.50	0.50
Sat Flow, veh/h	1325	2779	787	1173	3518	159	1381	54	1570	111	979	647
Grp Volume(v), veh/h	3	112	114	395	45	47	1	0	91	51	0	0
Grp Sat Flow(s),veh/h/ln	1325	1805	1761	1173	1805	1872	1381	0	1623	1738	0	0
Q Serve(g_s), s	0.1	3.9	4.1	31.9	1.5	1.5	0.0	0.0	3.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.7	3.9	4.1	36.0	1.5	1.5	0.0	0.0	3.0	1.5	0.0	0.0
Prop In Lane	1.00		0.45	1.00		0.08	1.00		0.97	0.10		0.37
Lane Grp Cap(c), veh/h	599	745	727	508	745	772	772	0	815	913	0	0
V/C Ratio(X)	0.01	0.15	0.16	0.78	0.06	0.06	0.00	0.00	0.11	0.06	0.00	0.00
Avail Cap(c_a), veh/h	847	1083	1057	728	1083	1123	772	0	815	913	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	0.89	0.00	0.89	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.2	18.4	18.4	29.7	17.7	17.7	12.4	0.0	13.1	12.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	3.4	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.1	1.9	2.0	10.8	0.8	0.8	0.0	0.0	1.4	0.8	0.0	0.0
LnGrp Delay(d),s/veh	18.2	18.5	18.5	33.1	17.7	17.7	12.4	0.0	13.4	12.9	0.0	0.0
LnGrp LOS	B	B	B	C	B	B	B		B	B		
Approach Vol, veh/h		229			487			92			51	
Approach Delay, s/veh		18.5			30.2			13.4			12.9	
Approach LOS		B			C			B			B	

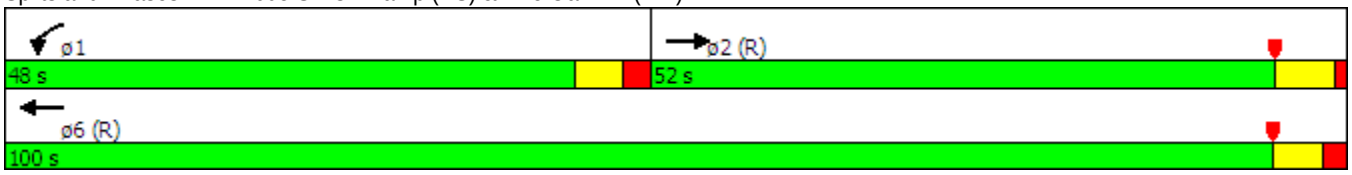
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		54.7		45.3		54.7		45.3
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		31.5		60.0		31.5		60.0
Max Q Clear Time (g_c+I1), s		5.0		6.1		3.5		38.0
Green Ext Time (p_c), s		0.5		3.6		0.5		3.3

Intersection Summary	
HCM 2010 Ctrl Delay	24.2
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1336	1173	584	1533	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	52.0		48.0	100.0		
Total Split (%)	52.0%		48.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



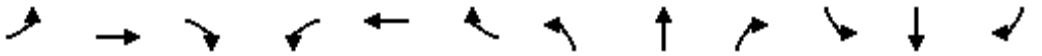
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1336	1173	584	1533	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	1437	0	628	1648		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	1798	804	767	3531		
Arrive On Green	0.50	0.00	0.85	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	1437	0	628	1648		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	33.2	0.0	17.2	0.0		
Cycle Q Clear(g_c), s	33.2	0.0	17.2	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	1798	804	767	3531		
V/C Ratio(X)	0.80	0.00	0.82	0.47		
Avail Cap(c_a), veh/h	1798	804	767	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	20.9	0.0	5.7	0.0		
Incr Delay (d2), s/veh	3.8	0.0	9.5	0.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	17.3	0.0	9.7	0.2		
LnGrp Delay(d),s/veh	24.8	0.0	15.2	0.4		
LnGrp LOS	C		B	A		
Approach Vol, veh/h	1437			2276		
Approach Delay, s/veh	24.8			4.5		
Approach LOS	C			A		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	48.0	55.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	42.4	* 47				94.4		
Max Q Clear Time (g_c+I1), s	19.2	35.2				2.0		
Green Ext Time (p_c), s	5.3	11.1				83.9		

Intersection Summary	
HCM 2010 Ctrl Delay	12.3
HCM 2010 LOS	B

Notes

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	1336	0	0	1287	0	0	0	583	0	0	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	147.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1336	0	0	1287	0	0	0	583	0	0	831
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1377	0	0	1327	0	0	0	601	0	0	857

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1327	0	0	1377	0	0	2040	2704	689	2016	2704	663
Stage 1	-	-	-	-	-	-	1377	1377	-	1327	1327	-
Stage 2	-	-	-	-	-	-	663	1327	-	689	1377	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	527	-	-	504	-	-	34	22	~ 393	35	22	~ 409
Stage 1	-	-	-	-	-	-	155	214	-	167	227	-
Stage 2	-	-	-	-	-	-	422	227	-	407	214	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	527	-	-	504	-	-	-	22	~ 393	-	22	~ 409
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	22	-	-	22	-
Stage 1	-	-	-	-	-	-	155	214	-	167	227	-
Stage 2	-	-	-	-	-	-	-	227	-	-	214	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	276.4	$ 522.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	393	527	-	-	504	-	-	409
HCM Lane V/C Ratio	1.529	-	-	-	-	-	-	2.095
HCM Control Delay (s)	276.4	0	-	-	0	-	-	$ 522.7
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	32.9	0	-	-	0	-	-	61.2

Notes

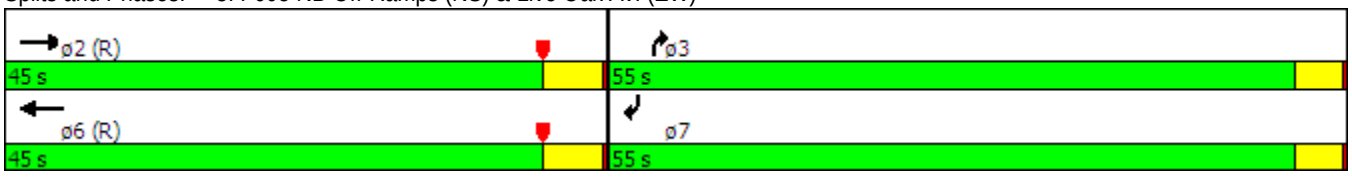
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

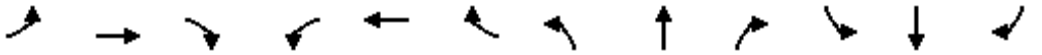
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1336	0	0	1287	0	0	0	583	0	0	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Detector Phase		2			6				3			7
Switch Phase												
Minimum Initial (s)		10.0			10.0				4.0			4.0
Minimum Split (s)		21.0			21.0				8.0			8.0
Total Split (s)		45.0			45.0				55.0			55.0
Total Split (%)		45.0%			45.0%				55.0%			55.0%
Yellow Time (s)		4.5			4.5				3.5			3.5
All-Red Time (s)		0.5			0.5				0.5			0.5
Lost Time Adjust (s)		0.0			0.0				0.0			0.0
Total Lost Time (s)		5.0			5.0				4.0			4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max				None			None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 79 (79%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1336	0	0	1287	0	0	0	583	0	0	831
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	0	0	1900	0	0	0	1900	0	0	1900
Adj Flow Rate, veh/h	0	1377	0	0	1327	0	0	0	601	0	0	857
Adj No. of Lanes	0	2	0	0	3	0	0	0	2	0	0	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	3430	0	0	4928	0	0	0	0	0	0	0
Arrive On Green	0.00	0.64	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	3800	0	0	5529	0		0			0	
Grp Volume(v), veh/h	0	1377	0	0	1327	0		0.0			0.0	
Grp Sat Flow(s),veh/h/ln	0	1805	0	0	1729	0						
Q Serve(g_s), s	0.0	18.6	0.0	0.0	0.0	0.0						
Cycle Q Clear(g_c), s	0.0	18.6	0.0	0.0	0.0	0.0						
Prop In Lane	0.00		0.00	0.00		0.00						
Lane Grp Cap(c), veh/h	0	3430	0	0	4928	0						
V/C Ratio(X)	0.00	0.40	0.00	0.00	0.27	0.00						
Avail Cap(c_a), veh/h	0	3430	0	0	4928	0						
HCM Platoon Ratio	1.00	0.67	1.00	1.00	2.00	1.00						
Upstream Filter(I)	0.00	0.40	0.00	0.00	0.91	0.00						
Uniform Delay (d), s/veh	0.0	4.3	0.0	0.0	0.0	0.0						
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(-26165%),veh/ln	0.0	9.3	0.0	0.0	0.1	0.0						
LnGrp Delay(d),s/veh	0.0	4.4	0.0	0.0	0.1	0.0						
LnGrp LOS		A			A							
Approach Vol, veh/h		1377			1327							
Approach Delay, s/veh		4.4			0.1							
Approach LOS		A			A							

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		
Phs Duration (G+Y+Rc), s		100.0				100.0		
Change Period (Y+Rc), s		5.0				5.0		
Max Green Setting (Gmax), s		40.0				40.0		
Max Q Clear Time (g_c+I1), s		20.6				2.0		
Green Ext Time (p_c), s		18.3				34.5		

Intersection Summary	
HCM 2010 Ctrl Delay	2.3
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1875	45	34	1269	17	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	66.0	66.0	8.0	74.0	26.0	
Total Split (%)	66.0%	66.0%	8.0%	74.0%	26.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



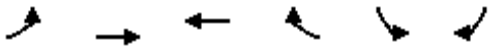
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1875	45	34	1269	17	21
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2038	49	37	1379	18	23
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	3025	1353	47	3227	23	29
Arrive On Green	1.00	1.00	0.05	1.00	0.03	0.03
Sat Flow, veh/h	3705	1615	1810	3705	728	931
Grp Volume(v), veh/h	2038	49	37	1379	42	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1699	0
Q Serve(g_s), s	0.0	0.0	2.0	0.0	2.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	2.0	0.0	2.5	0.0
Prop In Lane		1.00	1.00		0.43	0.55
Lane Grp Cap(c), veh/h	3025	1353	47	3227	53	0
V/C Ratio(X)	0.67	0.04	0.79	0.43	0.79	0.00
Avail Cap(c_a), veh/h	3025	1353	90	3227	391	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	47.2	0.0	48.1	0.0
Incr Delay (d2), s/veh	1.2	0.0	10.5	0.4	22.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.5	0.0	1.1	0.2	1.5	0.0
LnGrp Delay(d),s/veh	1.2	0.0	57.7	0.4	70.9	0.0
LnGrp LOS	A	A	E	A	E	
Approach Vol, veh/h	2087			1416	42	
Approach Delay, s/veh	1.2			1.9	70.9	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.6	88.3				93.9		6.1
Change Period (Y+Rc), s	3.0	4.5				4.5		3.0
Max Green Setting (Gmax), s	5.0	61.5				69.5		23.0
Max Q Clear Time (g_c+I1), s	4.0	2.0				2.0		4.5
Green Ext Time (p_c), s	0.0	55.9				63.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	2.3
HCM 2010 LOS	A

Notes

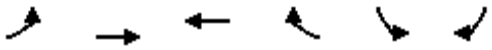
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	46	1831	1221	6	11	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	46	1831	1221	6	11	70
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	48	1927	1285	6	12	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.81				0.67	0.81
vC, conflicting volume	1292				2346	643
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	891				732	90
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				95	90
cM capacity (veh/h)	623				221	775

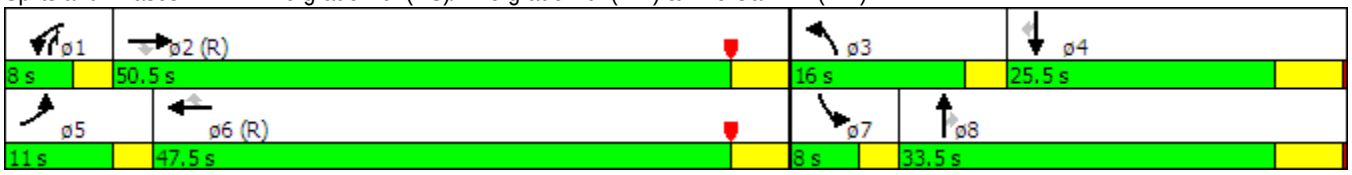
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	48	964	964	643	643	6	85
Volume Left	48	0	0	0	0	0	12
Volume Right	0	0	0	0	0	6	74
cSH	623	1700	1700	1700	1700	1700	579
Volume to Capacity	0.08	0.57	0.57	0.38	0.38	0.00	0.15
Queue Length 95th (ft)	6	0	0	0	0	0	13
Control Delay (s)	11.3	0.0	0.0	0.0	0.0	0.0	12.3
Lane LOS	B						B
Approach Delay (s)	0.3			0.0			12.3
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	1738	33	83	1062	6	109	65	368	27	20	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	11.0	50.5	50.5	8.0	47.5	47.5	16.0	33.5	8.0	8.0	25.5	25.5
Total Split (%)	11.0%	50.5%	50.5%	8.0%	47.5%	47.5%	16.0%	33.5%	8.0%	8.0%	25.5%	25.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	79	1738	33	83	1062	6	109	65	368	27	20	58
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	86	1889	0	90	1154	7	118	71	400	29	22	63
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	110	1837	822	90	1798	805	147	492	499	40	723	323
Arrive On Green	0.08	0.68	0.00	0.10	1.00	1.00	0.08	0.26	0.26	0.01	0.07	0.07
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	86	1889	0	90	1154	7	118	71	400	29	22	63
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	4.7	50.9	0.0	5.0	0.3	0.0	6.4	2.9	22.7	1.6	0.6	3.7
Cycle Q Clear(g_c), s	4.7	50.9	0.0	5.0	0.3	0.0	6.4	2.9	22.7	1.6	0.6	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	110	1837	822	90	1798	805	147	492	499	40	723	323
V/C Ratio(X)	0.78	1.03	0.00	0.99	0.64	0.01	0.80	0.14	0.80	0.72	0.03	0.19
Avail Cap(c_a), veh/h	145	1837	822	90	1798	805	235	532	533	90	723	323
HCM Platoon Ratio	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	16.2	0.0	45.0	0.1	0.1	45.2	28.5	31.7	49.3	37.6	39.1
Incr Delay (d2), s/veh	13.3	28.6	0.0	87.1	1.6	0.0	4.0	0.2	9.1	8.8	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	2.7	32.1	0.0	4.6	0.5	0.0	3.4	1.5	11.4	0.9	0.3	1.7
LnGrp Delay(d),s/veh	58.6	44.8	0.0	132.1	1.7	0.1	49.2	28.7	40.8	58.1	37.6	39.6
LnGrp LOS	E	F		F	A	A	D	C	D	E	D	D
Approach Vol, veh/h		1975			1251			589			114	
Approach Delay, s/veh		45.4			11.0			41.0			43.9	
Approach LOS		D			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	55.4	11.1	25.5	9.1	54.3	5.2	31.4
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	5.0	46.0	13.0	20.0	8.0	43.0	5.0	28.0
Max Q Clear Time (g_c+I1), s	7.0	52.9	8.4	5.7	6.7	2.3	3.6	24.7
Green Ext Time (p_c), s	0.0	0.0	0.0	3.3	0.0	37.7	0.0	1.2

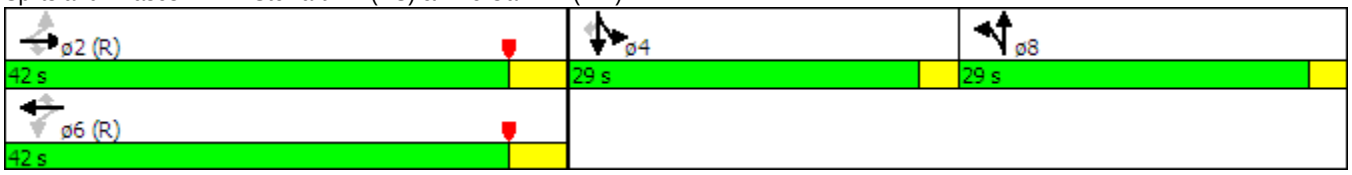
Intersection Summary	
HCM 2010 Ctrl Delay	33.8
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	1993	282	39	1036	1	79	21	11	23	103	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 19 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	59	1993	282	39	1036	1	79	21	11	23	103	13
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	64	2166	307	42	1126	1	86	23	12	25	112	14
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	440	2621	1173	171	2621	1173	112	30	16	148	155	132
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.08	0.08	0.08
Sat Flow, veh/h	508	3610	1615	137	3610	1615	1282	343	179	1810	1900	1615
Grp Volume(v), veh/h	64	2166	307	42	1126	1	121	0	0	25	112	14
Grp Sat Flow(s),veh/h/ln	508	1805	1615	137	1805	1615	1804	0	0	1810	1900	1615
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	6.6	0.0	0.0	1.3	5.8	0.8
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	6.6	0.0	0.0	1.3	5.8	0.8
Prop In Lane	1.00		1.00	1.00		1.00	0.71		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	440	2621	1173	171	2621	1173	157	0	0	148	155	132
V/C Ratio(X)	0.15	0.83	0.26	0.24	0.43	0.00	0.77	0.00	0.00	0.17	0.72	0.11
Avail Cap(c_a), veh/h	440	2621	1173	171	2621	1173	469	0	0	470	494	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.35	0.35	0.35	0.91	0.91	0.91	1.00	0.00	0.00	0.66	0.66	0.66
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	44.6	0.0	0.0	42.8	44.8	42.5
Incr Delay (d2), s/veh	0.2	1.1	0.2	3.1	0.5	0.0	7.6	0.0	0.0	0.4	4.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.4	0.1	0.1	0.2	0.0	3.6	0.0	0.0	0.7	3.2	0.4
LnGrp Delay(d),s/veh	0.2	1.1	0.2	3.1	0.5	0.0	52.3	0.0	0.0	43.1	48.9	42.8
LnGrp LOS	A	A	A	A	A	A	D			D	D	D
Approach Vol, veh/h		2537			1169			121			151	
Approach Delay, s/veh		1.0			0.6			52.3			47.4	
Approach LOS		A			A			D			D	

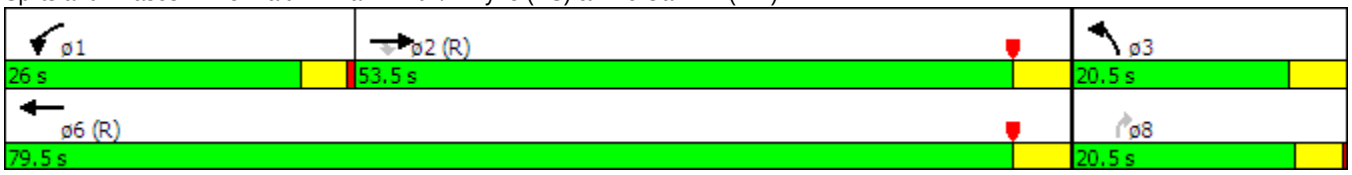
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		77.1		11.2		77.1		11.7
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		2.0		7.8		2.0		8.6
Green Ext Time (p_c), s		28.9		0.5		28.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	4.2
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1381	536	267	1121	99	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	200		100	0
Storage Lanes		1	1		1	1
Taper Length (ft)			60		60	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	1141			511	1039	
Travel Time (s)	17.3			7.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				8
Detector Phase	2	2	1	6	3	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	10.0	4.0
Minimum Split (s)	20.5	20.5	8.0	20.0	20.5	20.0
Total Split (s)	53.5	53.5	26.0	79.5	20.5	20.5
Total Split (%)	53.5%	53.5%	26.0%	79.5%	20.5%	20.5%
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5	3.5
All-Red Time (s)	0.0	0.0	0.5	0.0	0.0	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.0	4.5	4.5	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1381	536	267	1121	99	86
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	1501	583	290	1218	108	93
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1927	862	319	2708	562	258
Arrive On Green	0.36	0.36	0.35	1.00	0.16	0.16
Sat Flow, veh/h	3705	1615	1810	3705	3510	1615
Grp Volume(v), veh/h	1501	583	290	1218	108	93
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1755	1615
Q Serve(g_s), s	37.0	30.6	15.3	0.0	2.7	5.1
Cycle Q Clear(g_c), s	37.0	30.6	15.3	0.0	2.7	5.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1927	862	319	2708	562	258
V/C Ratio(X)	0.78	0.68	0.91	0.45	0.19	0.36
Avail Cap(c_a), veh/h	1927	862	398	2708	562	258
HCM Platoon Ratio	0.67	0.67	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.33	0.33	0.76	0.76	1.00	1.00
Uniform Delay (d), s/veh	26.9	24.8	31.6	0.0	36.4	37.4
Incr Delay (d2), s/veh	1.1	1.4	17.3	0.4	0.8	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	18.8	14.0	9.1	0.2	1.3	2.6
LnGrp Delay(d),s/veh	27.9	26.2	48.9	0.4	37.2	41.3
LnGrp LOS	C	C	D	A	D	D
Approach Vol, veh/h	2084			1508	201	
Approach Delay, s/veh	27.5			9.7	39.1	
Approach LOS	C			A	D	

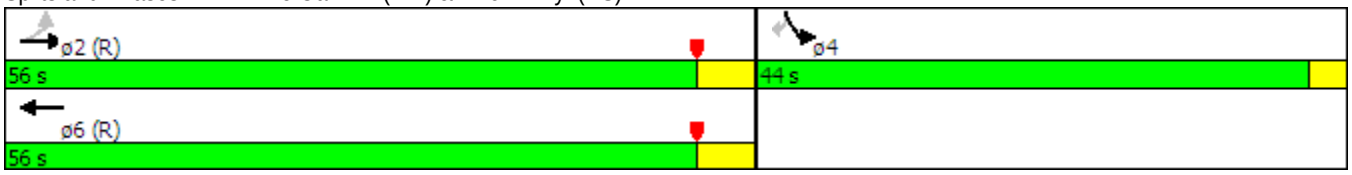
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	21.6	57.9				79.5		20.5
Change Period (Y+Rc), s	4.0	4.5				4.5		4.5
Max Green Setting (Gmax), s	22.0	49.0				75.0		16.0
Max Q Clear Time (g_c+I1), s	17.3	39.0				2.0		7.1
Green Ext Time (p_c), s	0.4	9.8				67.4		0.7

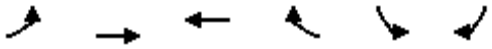
Intersection Summary	
HCM 2010 Ctrl Delay	21.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	43	1424	1251	0	1100	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	20.0	20.0	28.5		27.0	27.0
Total Split (s)	56.0	56.0	56.0		44.0	44.0
Total Split (%)	56.0%	56.0%	56.0%		44.0%	44.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 21 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	43	1424	1251	0	1100	137
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	44	1468	1290	0	1134	141
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	213	2041	2041	0	1263	581
Arrive On Green	0.38	0.38	0.57	0.00	0.36	0.36
Sat Flow, veh/h	435	3705	3800	0	3510	1615
Grp Volume(v), veh/h	44	1468	1290	0	1134	141
Grp Sat Flow(s),veh/h/ln	435	1805	1805	0	1755	1615
Q Serve(g_s), s	8.5	34.7	24.2	0.0	30.6	6.1
Cycle Q Clear(g_c), s	32.7	34.7	24.2	0.0	30.6	6.1
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	213	2041	2041	0	1263	581
V/C Ratio(X)	0.21	0.72	0.63	0.00	0.90	0.24
Avail Cap(c_a), veh/h	213	2041	2041	0	1439	662
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.53	0.53	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	24.3	14.7	0.0	30.3	22.5
Incr Delay (d2), s/veh	1.2	1.2	1.5	0.0	7.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.1	17.6	12.4	0.0	16.1	2.8
LnGrp Delay(d),s/veh	35.0	25.5	16.2	0.0	37.5	22.7
LnGrp LOS	C	C	B		D	C
Approach Vol, veh/h		1512	1290		1275	
Approach Delay, s/veh		25.8	16.2		35.9	
Approach LOS		C	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		61.0		39.0		61.0		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		51.5		41.0		51.5		
Max Q Clear Time (g_c+I1), s		36.7		32.6		26.2		
Green Ext Time (p_c), s		14.3		3.4		24.1		

Intersection Summary	
HCM 2010 Ctrl Delay	25.9
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2006	507	64	1938	264	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	80.0	80.0	80.0	80.0	20.0	20.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2006	507	64	1938	264	101
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2180	551	70	2107	287	110
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2708	1211	111	3890	562	258
Arrive On Green	0.75	0.75	0.75	0.75	0.16	0.16
Sat Flow, veh/h	3705	1615	106	5358	3510	1615
Grp Volume(v), veh/h	2180	551	70	2107	287	110
Grp Sat Flow(s),veh/h/ln	1805	1615	106	1729	1755	1615
Q Serve(g_s), s	38.1	12.9	36.9	17.1	7.5	6.1
Cycle Q Clear(g_c), s	38.1	12.9	75.0	17.1	7.5	6.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2708	1211	111	3890	562	258
V/C Ratio(X)	0.81	0.45	0.63	0.54	0.51	0.43
Avail Cap(c_a), veh/h	2708	1211	111	3890	562	258
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.9	4.7	39.7	5.3	38.4	37.9
Incr Delay (d2), s/veh	2.7	1.2	24.2	0.5	3.3	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	19.5	6.1	2.7	8.2	3.9	3.1
LnGrp Delay(d),s/veh	10.6	6.0	63.9	5.8	41.7	42.9
LnGrp LOS	B	A	E	A	D	D
Approach Vol, veh/h	2731			2177	397	
Approach Delay, s/veh	9.6			7.7	42.1	
Approach LOS	A			A	D	

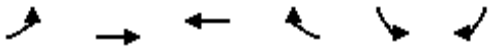
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		80.0				80.0		20.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		75.0				75.0		16.0
Max Q Clear Time (g_c+I1), s		40.1				77.0		9.5
Green Ext Time (p_c), s		34.8				0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.3
HCM 2010 LOS	B

VOLUME-TO-CAPACITY RATIO

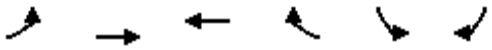
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	587	0	259	1707	943	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	638	0	282	1855	1025	274
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	638	0	282	1855	1025	274
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	44.2		11.7	59.9	32.1	100.0
Effective Green, g (s)	44.2		11.7	59.9	32.1	100.0
Actuated g/C Ratio	0.44		0.12	0.60	0.32	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1595		409	2162	1124	1615
v/s Ratio Prot	0.18		0.08	c0.51	c0.29	
v/s Ratio Perm						0.17
v/c Ratio	0.40		0.69	0.86	0.91	0.17
Uniform Delay, d1	18.9		42.4	16.5	32.6	0.0
Progression Factor	1.00		1.25	0.96	1.03	1.00
Incremental Delay, d2	0.8		0.4	0.4	10.2	0.2
Delay (s)	19.7		53.5	16.4	43.8	0.2
Level of Service	B		D	B	D	A
Approach Delay (s)	19.7			21.3	34.6	
Approach LOS	B			C	C	

Intersection Summary			
Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



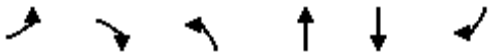
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	294	532	1886	660	192	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	320	578	2050	717	209	135
RTOR Reduction (vph)	0	0	0	263	0	120
Lane Group Flow (vph)	320	578	2050	454	209	15
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	27.7	78.2	47.5	47.5	11.3	11.3
Effective Green, g (s)	27.7	78.2	47.5	47.5	11.3	11.3
Actuated g/C Ratio	0.28	0.78	0.48	0.48	0.11	0.11
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	499	2823	1714	767	395	182
v/s Ratio Prot	c0.18	0.16	c0.57		c0.06	
v/s Ratio Perm				0.28		0.01
v/c Ratio	0.64	0.20	1.20	0.59	0.53	0.08
Uniform Delay, d1	31.8	2.8	26.2	19.2	41.8	39.7
Progression Factor	0.54	2.59	0.86	1.03	1.00	1.00
Incremental Delay, d2	2.0	0.2	92.2	2.2	1.3	0.2
Delay (s)	19.0	7.5	114.9	22.0	43.1	39.9
Level of Service	B	A	F	C	D	D
Approach Delay (s)		11.6	90.8		41.9	
Approach LOS		B	F		D	

Intersection Summary			
Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	714	1889	0	395	652
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	760	2010	0	420	694
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	760	2010	0	420	694
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		64.4	64.4		26.0	100.0
Effective Green, g (s)		64.4	64.4		26.0	100.0
Actuated g/C Ratio		0.64	0.64		0.26	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		3340	2324		469	1615
v/s Ratio Prot		0.15	c0.56		c0.23	
v/s Ratio Perm						0.43
v/c Ratio		0.23	0.86		0.90	0.43
Uniform Delay, d1		7.4	14.3		35.7	0.0
Progression Factor		1.68	0.92		1.00	1.00
Incremental Delay, d2		0.2	3.2		19.2	0.8
Delay (s)		12.6	16.3		54.9	0.8
Level of Service		B	B		D	A
Approach Delay (s)		12.6	16.3		21.2	
Approach LOS		B	B		C	

Intersection Summary			
Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

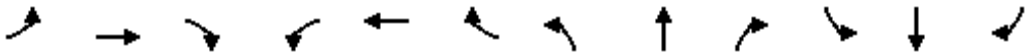


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	236	12	21	2016	511	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.44	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	844	3610	3610	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	257	13	23	2191	555	332
RTOR Reduction (vph)	0	11	0	0	0	70
Lane Group Flow (vph)	257	2	23	2191	555	262
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	12.6	12.6	78.9	78.9	78.9	78.9
Effective Green, g (s)	12.6	12.6	78.9	78.9	78.9	78.9
Actuated g/C Ratio	0.13	0.13	0.79	0.79	0.79	0.79
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	441	203	665	2848	2848	1274
v/s Ratio Prot	c0.07			c0.61	0.15	
v/s Ratio Perm		0.00	0.03			0.16
v/c Ratio	0.58	0.01	0.03	0.77	0.19	0.21
Uniform Delay, d1	41.2	38.2	2.3	5.7	2.6	2.7
Progression Factor	1.51	2.07	1.33	1.05	1.83	7.51
Incremental Delay, d2	2.0	0.0	0.0	1.0	0.1	0.3
Delay (s)	64.0	79.0	3.1	7.0	5.0	20.3
Level of Service	E	E	A	A	A	C
Approach Delay (s)	64.7			6.9	10.7	
Approach LOS	E			A	B	

Intersection Summary

Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

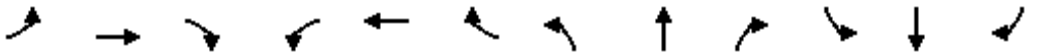


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	116	10	95	266	11	10	9	88	7	6	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3568		1805	3589		1805	1641			1745	
Flt Permitted	0.39	1.00		0.66	1.00		0.74	1.00			0.96	
Satd. Flow (perm)	748	3568		1259	3589		1400	1641			1693	
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)	26	130	11	107	299	12	11	10	99	8	7	16
RTOR Reduction (vph)	0	9	0	0	5	0	0	23	0	0	4	0
Lane Group Flow (vph)	26	132	0	107	306	0	11	86	0	0	27	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)	15.0	15.0		15.0	15.0		76.5	76.5			76.5	
Effective Green, g (s)	15.0	15.0		15.0	15.0		76.5	76.5			76.5	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.76	0.76			0.76	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	112	535		188	538		1071	1255			1295	
v/s Ratio Prot		0.04			c0.09			c0.05				
v/s Ratio Perm	0.03			0.08			0.01				0.02	
v/c Ratio	0.23	0.25		0.57	0.57		0.01	0.07			0.02	
Uniform Delay, d1	37.4	37.5		39.5	39.5		2.8	2.9			2.8	
Progression Factor	0.79	0.78		0.83	0.80		0.32	0.09			1.00	
Incremental Delay, d2	1.0	0.2		3.9	1.4		0.0	0.1			0.0	
Delay (s)	30.4	29.4		36.7	32.9		0.9	0.3			2.8	
Level of Service	C	C		D	C		A	A			A	
Approach Delay (s)		29.5			33.9			0.4			2.8	
Approach LOS		C			C			A			A	

Intersection Summary			
Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	330	674	699	1551	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	351	717	744	1650	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	351	717	744	1650	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	21.5	100.0	67.4	100.0		
Effective Green, g (s)	21.5	100.0	67.4	100.0		
Actuated g/C Ratio	0.22	1.00	0.67	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	776	1615	1216	3610		
v/s Ratio Prot	0.10		c0.41	c0.46		
v/s Ratio Perm		0.44				
v/c Ratio	0.45	0.44	0.61	0.46		
Uniform Delay, d1	34.1	0.0	9.0	0.0		
Progression Factor	0.74	1.00	0.71	1.00		
Incremental Delay, d2	1.9	0.9	2.2	0.4		
Delay (s)	27.0	0.9	8.6	0.4		
Level of Service	C	A	A	A		
Approach Delay (s)	9.5			3.0	0.0	
Approach LOS	A			A	A	

Intersection Summary			
Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	330	0	0	1505	0	0	0	674	0	0	745
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0				4.0			4.0
Lane Util. Factor		0.95			0.91				0.88			1.00
Frt		1.00			1.00				0.85			0.86
Flt Protected		1.00			1.00				1.00			1.00
Satd. Flow (prot)		3610			5187				2842			1644
Flt Permitted		1.00			1.00				1.00			1.00
Satd. Flow (perm)		3610			5187				2842			1644
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	340	0	0	1552	0	0	0	695	0	0	768
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	275	0	0	11
Lane Group Flow (vph)	0	340	0	0	1552	0	0	0	420	0	0	757
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Actuated Green, G (s)		39.7			39.7				51.3			51.3
Effective Green, g (s)		39.7			39.7				51.3			51.3
Actuated g/C Ratio		0.40			0.40				0.51			0.51
Clearance Time (s)		5.0			5.0				4.0			4.0
Vehicle Extension (s)		4.5			4.5				3.0			3.0
Lane Grp Cap (vph)		1433			2059				1457			843
v/s Ratio Prot		0.09			c0.30				0.15			c0.46
v/s Ratio Perm												
v/c Ratio		0.24			0.75				0.29			0.90
Uniform Delay, d1		20.1			25.9				13.9			22.0
Progression Factor		2.38			0.66				1.00			1.00
Incremental Delay, d2		0.4			2.2				0.1			12.3
Delay (s)		48.1			19.5				14.0			34.3
Level of Service		D			B				B			C
Approach Delay (s)		48.1			19.5			14.0			34.3	
Approach LOS		D			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	899	105	47	1354	151	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	3610	1615	1805	3610	1766	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	3610	1615	1805	3610	1766	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	977	114	51	1472	164	62
RTOR Reduction (vph)	0	17	0	0	15	0
Lane Group Flow (vph)	977	97	51	1472	211	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	67.4	67.4	5.0	75.4	17.1	
Effective Green, g (s)	67.4	67.4	5.0	75.4	17.1	
Actuated g/C Ratio	0.67	0.67	0.05	0.75	0.17	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2433	1088	90	2721	301	
v/s Ratio Prot	0.27		0.03	c0.41	c0.12	
v/s Ratio Perm		0.06				
v/c Ratio	0.40	0.09	0.57	0.54	0.70	
Uniform Delay, d1	7.3	5.7	46.4	5.1	39.0	
Progression Factor	0.94	1.04	0.72	2.54	1.00	
Incremental Delay, d2	0.5	0.2	4.3	0.7	7.2	
Delay (s)	7.3	6.0	37.6	13.7	46.2	
Level of Service	A	A	D	B	D	
Approach Delay (s)	7.2			14.5	46.2	
Approach LOS	A			B	D	

Intersection Summary			
Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	701	90	256	1205	13	51	50	106	30	75	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
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)	99	762	98	278	1310	14	55	54	115	33	82	77
RTOR Reduction (vph)	0	0	47	0	0	6	0	0	72	0	0	71
Lane Group Flow (vph)	99	762	51	278	1310	8	55	54	43	33	82	6
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	10.2	51.8	51.8	18.7	60.3	60.3	5.8	9.8	28.5	3.7	7.7	7.7
Effective Green, g (s)	10.2	51.8	51.8	18.7	60.3	60.3	5.8	9.8	28.5	3.7	7.7	7.7
Actuated g/C Ratio	0.10	0.52	0.52	0.19	0.60	0.60	0.06	0.10	0.28	0.04	0.08	0.08
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	184	1869	836	337	2176	973	104	186	460	66	277	124
v/s Ratio Prot	0.05	0.21		c0.15	c0.36		c0.03	c0.03	0.02	0.02	0.02	
v/s Ratio Perm			0.03			0.01			0.01			0.00
v/c Ratio	0.54	0.41	0.06	0.82	0.60	0.01	0.53	0.29	0.09	0.50	0.30	0.05
Uniform Delay, d1	42.7	14.7	12.0	39.1	12.4	7.9	45.8	41.9	26.3	47.2	43.6	42.8
Progression Factor	0.91	0.72	2.19	1.24	0.39	1.00	1.00	1.00	1.00	0.42	0.20	0.15
Incremental Delay, d2	1.4	0.6	0.1	8.8	0.7	0.0	2.2	1.5	0.0	2.1	1.0	0.3
Delay (s)	40.3	11.2	26.4	57.4	5.5	7.9	48.0	43.4	26.3	21.9	10.0	6.8
Level of Service	D	B	C	E	A	A	D	D	C	C	A	A
Approach Delay (s)		15.8			14.5			35.7			10.8	
Approach LOS		B			B			D			B	

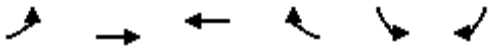
Intersection Summary				
Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	59.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	641	31	17	1547	36	224	121	33	13	28	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1824		1805	1900	1615
Flt Permitted	0.07	1.00	1.00	0.34	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	137	3610	1615	643	3610	1615		1824		1805	1900	1615
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)	21	697	34	18	1682	39	243	132	36	14	30	85
RTOR Reduction (vph)	0	0	15	0	0	15	0	4	0	0	0	80
Lane Group Flow (vph)	21	697	19	18	1682	24	0	407	0	14	30	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	55.4	55.4	55.4	55.4	55.4	55.4		27.9		6.2	6.2	6.2
Effective Green, g (s)	55.4	55.4	55.4	55.4	55.4	55.4		27.9		6.2	6.2	6.2
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.55	0.55		0.28		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	75	1999	894	356	1999	894		508		111	117	100
v/s Ratio Prot		0.19			c0.47			c0.22		0.01	c0.02	
v/s Ratio Perm	0.15		0.01	0.03		0.02						0.00
v/c Ratio	0.28	0.35	0.02	0.05	0.84	0.03		0.80		0.13	0.26	0.05
Uniform Delay, d1	11.8	12.3	10.1	10.2	18.6	10.1		33.5		44.3	44.7	44.1
Progression Factor	2.00	2.00	3.67	1.15	1.01	1.34		1.00		1.89	1.86	4.36
Incremental Delay, d2	8.6	0.5	0.0	0.2	3.6	0.0		8.9		0.5	1.2	0.2
Delay (s)	32.1	25.1	37.0	12.0	22.5	13.5		42.4		84.5	84.2	192.7
Level of Service	C	C	D	B	C	B		D		F	F	F
Approach Delay (s)		25.8			22.2			42.4			155.7	
Approach LOS		C			C			D			F	

Intersection Summary				
Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	78.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	540	65	134	1415	305	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	587	71	146	1538	332	322
RTOR Reduction (vph)	0	23	0	0	0	240
Lane Group Flow (vph)	587	48	146	1538	332	82
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	48.4	48.4	13.1	65.5	25.5	25.5
Effective Green, g (s)	48.4	48.4	13.1	65.5	25.5	25.5
Actuated g/C Ratio	0.48	0.48	0.13	0.66	0.26	0.26
Clearance Time (s)	4.5	4.5	4.0	4.5	4.5	4.5
Vehicle Extension (s)	4.5	4.5	3.0	4.5	4.5	4.5
Lane Grp Cap (vph)	1747	781	236	2364	893	411
v/s Ratio Prot	0.16		0.08	c0.43	c0.09	
v/s Ratio Perm		0.03				0.05
v/c Ratio	0.34	0.06	0.62	0.65	0.37	0.20
Uniform Delay, d1	15.9	13.7	41.1	10.4	30.7	29.2
Progression Factor	0.25	0.03	1.07	0.81	1.00	1.00
Incremental Delay, d2	0.5	0.1	4.1	1.2	1.2	1.1
Delay (s)	4.4	0.6	48.1	9.6	31.8	30.3
Level of Service	A	A	D	A	C	C
Approach Delay (s)	4.0			13.0	31.1	
Approach LOS	A			B	C	

Intersection Summary			
Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	101	734	1482	0	457	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.13	1.00	1.00		0.95	1.00
Satd. Flow (perm)	247	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	104	757	1528	0	471	68
RTOR Reduction (vph)	0	0	0	0	0	45
Lane Group Flow (vph)	104	757	1528	0	471	23
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	73.7	73.7	73.7		18.8	18.8
Effective Green, g (s)	73.7	73.7	73.7		18.8	18.8
Actuated g/C Ratio	0.74	0.74	0.74		0.19	0.19
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	182	2660	2660		658	303
v/s Ratio Prot		0.21	c0.42		c0.13	
v/s Ratio Perm	0.42					0.01
v/c Ratio	0.57	0.28	0.57		0.72	0.08
Uniform Delay, d1	6.0	4.4	6.0		38.1	33.5
Progression Factor	0.76	0.30	0.83		0.78	0.82
Incremental Delay, d2	11.7	0.3	0.4		3.7	0.1
Delay (s)	16.2	1.6	5.4		33.6	27.6
Level of Service	B	A	A		C	C
Approach Delay (s)		3.3	5.4		32.8	
Approach LOS		A	A		C	

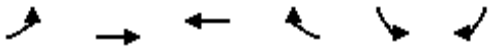
Intersection Summary			
Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	889	114	35	2787	631	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.26	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	492	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	966	124	38	3029	686	115
RTOR Reduction (vph)	0	27	0	0	0	35
Lane Group Flow (vph)	966	97	38	3029	686	80
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	66.0	66.0	66.0	66.0	25.0	25.0
Effective Green, g (s)	66.0	66.0	66.0	66.0	25.0	25.0
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.25	0.25
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2382	1065	324	3423	875	403
v/s Ratio Prot	0.27			c0.58	c0.20	
v/s Ratio Perm		0.06	0.08			0.05
v/c Ratio	0.41	0.09	0.12	0.88	0.78	0.20
Uniform Delay, d1	7.9	6.2	6.3	13.9	35.0	29.6
Progression Factor	0.55	0.62	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.7	3.8	7.0	1.1
Delay (s)	4.9	4.0	7.0	17.7	41.9	30.7
Level of Service	A	A	A	B	D	C
Approach Delay (s)	4.8			17.5	40.3	
Approach LOS	A			B	D	

Intersection Summary			
Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

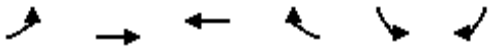
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	940	0	378	957	881	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1022	0	411	1040	958	320
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1022	0	411	1040	958	320
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	41.6		14.9	60.5	31.5	100.0
Effective Green, g (s)	41.6		14.9	60.5	31.5	100.0
Actuated g/C Ratio	0.42		0.15	0.60	0.32	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1501		521	2184	1103	1615
v/s Ratio Prot	c0.28		c0.12	0.29	c0.27	
v/s Ratio Perm						0.20
v/c Ratio	0.68		0.79	0.48	0.87	0.20
Uniform Delay, d1	23.8		41.0	11.0	32.3	0.0
Progression Factor	1.00		1.39	0.70	1.00	1.00
Incremental Delay, d2	2.5		6.1	0.6	7.4	0.3
Delay (s)	26.3		63.1	8.3	39.7	0.3
Level of Service	C		E	A	D	A
Approach Delay (s)	26.3			23.8	29.9	
Approach LOS	C			C	C	

Intersection Summary			
Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



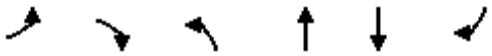
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	192	1028	1053	215	417	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	1117	1145	234	453	343
RTOR Reduction (vph)	0	0	0	111	0	279
Lane Group Flow (vph)	209	1117	1145	123	453	64
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	15.2	70.7	52.5	52.5	18.8	18.8
Effective Green, g (s)	15.2	70.7	52.5	52.5	18.8	18.8
Actuated g/C Ratio	0.15	0.71	0.52	0.52	0.19	0.19
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	274	2552	1895	847	658	303
v/s Ratio Prot	c0.12	0.31	c0.32		c0.13	
v/s Ratio Perm				0.08		0.04
v/c Ratio	0.76	0.44	0.60	0.15	0.69	0.21
Uniform Delay, d1	40.7	6.2	16.5	12.2	37.9	34.3
Progression Factor	0.53	2.38	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.1	0.5	1.4	0.4	3.0	0.4
Delay (s)	30.8	15.3	18.0	12.6	40.9	34.7
Level of Service	C	B	B	B	D	C
Approach Delay (s)		17.7	17.0		38.2	
Approach LOS		B	B		D	

Intersection Summary			
Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	1435	816	0	297	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1560	887	0	323	476
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1560	887	0	323	476
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		34.7	34.7		15.7	60.0
Effective Green, g (s)		34.7	34.7		15.7	60.0
Actuated g/C Ratio		0.58	0.58		0.26	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2999	2087		472	1615
v/s Ratio Prot		c0.30	0.25		c0.18	
v/s Ratio Perm						0.29
v/c Ratio		0.52	0.43		0.68	0.29
Uniform Delay, d1		7.6	7.1		19.9	0.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.6	0.6		4.1	0.5
Delay (s)		8.3	7.7		24.0	0.5
Level of Service		A	A		C	A
Approach Delay (s)		8.3	7.7		10.0	
Approach LOS		A	A		A	

Intersection Summary			
Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	159	17	19	975	1220	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.20	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	387	3610	3610	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	166	18	20	1016	1271	152
RTOR Reduction (vph)	0	16	0	0	0	28
Lane Group Flow (vph)	166	2	20	1016	1271	124
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	10.1	10.1	81.4	81.4	81.4	81.4
Effective Green, g (s)	10.1	10.1	81.4	81.4	81.4	81.4
Actuated g/C Ratio	0.10	0.10	0.81	0.81	0.81	0.81
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	353	163	315	2938	2938	1314
v/s Ratio Prot	c0.05			0.28	c0.35	
v/s Ratio Perm		0.00	0.05			0.08
v/c Ratio	0.47	0.01	0.06	0.35	0.43	0.09
Uniform Delay, d1	42.4	40.5	1.8	2.4	2.7	1.9
Progression Factor	1.00	1.00	0.95	0.89	1.00	1.00
Incremental Delay, d2	1.0	0.0	0.3	0.3	0.5	0.1
Delay (s)	43.4	40.5	2.1	2.4	3.1	2.0
Level of Service	D	D	A	A	A	A
Approach Delay (s)	43.1			2.4	3.0	
Approach LOS	D			A	A	

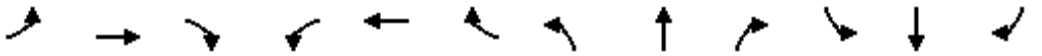
Intersection Summary			
Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	135	39	304	68	3	1	2	68	4	21	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.85			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1805	3488		1805	3586		1805	1624			1796	
Flt Permitted	0.69	1.00		0.61	1.00		0.72	1.00			0.98	
Satd. Flow (perm)	1319	3488		1160	3586		1375	1624			1774	
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)	3	175	51	395	88	4	1	3	88	5	27	19
RTOR Reduction (vph)	0	28	0	0	2	0	0	52	0	0	11	0
Lane Group Flow (vph)	3	198	0	395	90	0	1	39	0	0	40	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)	27.1	27.1		27.1	27.1		24.4	24.4			24.4	
Effective Green, g (s)	27.1	27.1		27.1	27.1		24.4	24.4			24.4	
Actuated g/C Ratio	0.45	0.45		0.45	0.45		0.41	0.41			0.41	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	595	1575		523	1619		559	660			721	
v/s Ratio Prot		0.06			0.03			c0.02				
v/s Ratio Perm	0.00			c0.34			0.00				0.02	
v/c Ratio	0.01	0.13		0.76	0.06		0.00	0.06			0.06	
Uniform Delay, d1	9.0	9.6		13.7	9.3		10.6	10.8			10.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.0		6.1	0.0		0.0	0.2			0.1	
Delay (s)	9.0	9.6		19.8	9.3		10.6	11.0			10.9	
Level of Service	A	A		B	A		B	B			B	
Approach Delay (s)		9.6			17.8			11.0			10.9	
Approach LOS		A			B			B			B	

Intersection Summary				
Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.5	
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1336	1173	584	1533	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1437	1261	628	1648	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1437	1261	628	1648	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	26.5	60.0	22.4	60.0		
Effective Green, g (s)	26.5	60.0	22.4	60.0		
Actuated g/C Ratio	0.44	1.00	0.37	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	1594	1615	673	3610		
v/s Ratio Prot	0.40		0.35	0.46		
v/s Ratio Perm		c0.78				
v/c Ratio	0.90	0.78	0.93	0.46		
Uniform Delay, d1	15.5	0.0	18.1	0.0		
Progression Factor	1.00	1.00	0.95	1.00		
Incremental Delay, d2	8.6	3.8	21.4	0.4		
Delay (s)	24.2	3.8	38.6	0.4		
Level of Service	C	A	D	A		
Approach Delay (s)	14.7			10.9	0.0	
Approach LOS	B			B	A	

Intersection Summary			
Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

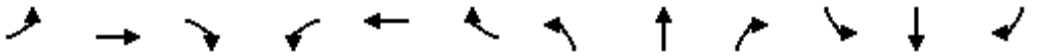


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1336	0	0	1287	0	0	0	583	0	0	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0				4.0			4.0
Lane Util. Factor		0.95			0.91				0.88			1.00
Frt		1.00			1.00				0.85			0.86
Flt Protected		1.00			1.00				1.00			1.00
Satd. Flow (prot)		3610			5187				2842			1644
Flt Permitted		1.00			1.00				1.00			1.00
Satd. Flow (perm)		3610			5187				2842			1644
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	1377	0	0	1327	0	0	0	601	0	0	857
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	11	0	0	11
Lane Group Flow (vph)	0	1377	0	0	1327	0	0	0	590	0	0	846
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Actuated Green, G (s)		40.0			40.0				51.0			51.0
Effective Green, g (s)		40.0			40.0				51.0			51.0
Actuated g/C Ratio		0.40			0.40				0.51			0.51
Clearance Time (s)		5.0			5.0				4.0			4.0
Vehicle Extension (s)		4.5			4.5				3.0			3.0
Lane Grp Cap (vph)		1444			2074				1449			838
v/s Ratio Prot		c0.38			0.26				0.21			c0.51
v/s Ratio Perm												
v/c Ratio		0.95			0.64				0.41			1.01
Uniform Delay, d1		29.1			24.2				15.2			24.5
Progression Factor		0.98			0.94				1.00			1.00
Incremental Delay, d2		8.8			1.4				0.2			33.5
Delay (s)		37.2			24.2				15.3			58.0
Level of Service		D			C				B			E
Approach Delay (s)		37.2			24.2			15.3			58.0	
Approach LOS		D			C			B			E	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

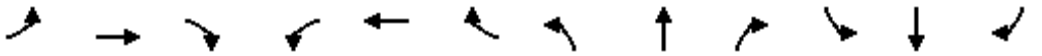
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1875	45	34	1269	17	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.92	
Flt Protected	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)	3610	1615	1805	3610	1718	
Flt Permitted	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (perm)	3610	1615	1805	3610	1718	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2038	49	37	1379	18	23
RTOR Reduction (vph)	0	3	0	0	22	0
Lane Group Flow (vph)	2038	46	37	1379	19	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	44.4	44.4	2.1	49.5	3.0	
Effective Green, g (s)	44.4	44.4	2.1	49.5	3.0	
Actuated g/C Ratio	0.74	0.74	0.04	0.82	0.05	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2671	1195	63	2978	85	
v/s Ratio Prot	c0.56		c0.02	0.38	c0.01	
v/s Ratio Perm		0.03				
v/c Ratio	0.76	0.04	0.59	0.46	0.23	
Uniform Delay, d1	4.7	2.1	28.5	1.5	27.4	
Progression Factor	1.21	0.49	1.00	1.00	1.00	
Incremental Delay, d2	1.7	0.0	8.7	0.5	1.3	
Delay (s)	7.3	1.1	37.2	2.0	28.7	
Level of Service	A	A	D	A	C	
Approach Delay (s)	7.2			2.9	28.7	
Approach LOS	A			A	C	

Intersection Summary			
Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	1738	33	83	1062	6	109	65	368	27	20	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
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)	86	1889	36	90	1154	7	118	71	400	29	22	63
RTOR Reduction (vph)	0	0	16	0	0	3	0	0	43	0	0	59
Lane Group Flow (vph)	86	1889	20	90	1154	4	118	71	357	29	22	4
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	8.2	55.0	55.0	13.6	60.4	60.4	9.2	10.7	24.3	4.7	6.2	6.2
Effective Green, g (s)	8.2	55.0	55.0	13.6	60.4	60.4	9.2	10.7	24.3	4.7	6.2	6.2
Actuated g/C Ratio	0.08	0.55	0.55	0.14	0.60	0.60	0.09	0.11	0.24	0.05	0.06	0.06
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	148	1985	888	245	2180	975	166	203	392	84	223	100
v/s Ratio Prot	0.05	c0.52		0.05	0.32		c0.07	0.04	c0.12	0.02	0.01	
v/s Ratio Perm			0.01			0.00			0.10			0.00
v/c Ratio	0.58	0.95	0.02	0.37	0.53	0.00	0.71	0.35	0.91	0.35	0.10	0.04
Uniform Delay, d1	44.2	21.2	10.3	39.3	11.5	7.9	44.1	41.4	36.8	46.2	44.3	44.1
Progression Factor	1.00	1.00	1.00	1.35	0.71	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.7	11.6	0.0	0.3	0.8	0.0	11.3	1.8	24.4	0.9	0.3	0.3
Delay (s)	48.0	32.9	10.3	53.3	9.1	7.9	55.4	43.2	61.2	47.1	44.6	44.4
Level of Service	D	C	B	D	A	A	E	D	E	D	D	D
Approach Delay (s)		33.1			12.2			57.8			45.1	
Approach LOS		C			B			E			D	

Intersection Summary				
Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	84.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

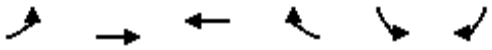


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	1993	282	39	1036	1	79	21	11	23	103	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1810		1805	1900	1615
Flt Permitted	0.21	1.00	1.00	0.06	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	394	3610	1615	114	3610	1615		1810		1805	1900	1615
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)	64	2166	307	42	1126	1	86	23	12	25	112	14
RTOR Reduction (vph)	0	0	57	0	0	0	0	4	0	0	0	12
Lane Group Flow (vph)	64	2166	250	42	1126	1	0	117	0	25	112	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	66.6	66.6	66.6	66.6	66.6	66.6		11.7		11.2	11.2	11.2
Effective Green, g (s)	66.6	66.6	66.6	66.6	66.6	66.6		11.7		11.2	11.2	11.2
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.67	0.67		0.12		0.11	0.11	0.11
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	262	2404	1075	75	2404	1075		211		202	212	180
v/s Ratio Prot		c0.60			0.31			c0.06		0.01	c0.06	
v/s Ratio Perm	0.16		0.15	0.37		0.00						0.00
v/c Ratio	0.24	0.90	0.23	0.56	0.47	0.00		0.55		0.12	0.53	0.01
Uniform Delay, d1	6.7	13.9	6.6	8.9	8.1	5.6		41.7		40.0	41.9	39.5
Progression Factor	1.56	1.16	2.05	0.81	0.79	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	3.4	0.3	24.9	0.6	0.0		3.1		0.3	2.4	0.0
Delay (s)	11.5	19.5	13.8	32.2	7.0	5.6		44.8		40.3	44.3	39.5
Level of Service	B	B	B	C	A	A		D		D	D	D
Approach Delay (s)		18.6			7.9			44.8			43.2	
Approach LOS		B			A			D			D	

Intersection Summary				
Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	75.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1381	536	267	1121	99	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1501	583	290	1218	108	93
RTOR Reduction (vph)	0	76	0	0	0	78
Lane Group Flow (vph)	1501	507	290	1218	108	15
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				8
Actuated Green, G (s)	51.3	51.3	19.7	75.0	16.0	16.5
Effective Green, g (s)	51.3	51.3	19.7	75.0	16.0	16.5
Actuated g/C Ratio	0.51	0.51	0.20	0.75	0.16	0.16
Clearance Time (s)	4.5	4.5	4.0	4.5	4.5	4.0
Vehicle Extension (s)	4.5	4.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	1851	828	355	2707	560	266
v/s Ratio Prot	c0.42		c0.16	0.34	c0.03	
v/s Ratio Perm		0.31				0.01
v/c Ratio	0.81	0.61	0.82	0.45	0.19	0.06
Uniform Delay, d1	20.3	17.3	38.4	4.7	36.4	35.2
Progression Factor	1.12	1.32	0.98	1.33	1.00	1.00
Incremental Delay, d2	1.8	1.5	11.4	0.4	0.8	0.1
Delay (s)	24.6	24.3	49.1	6.7	37.2	35.3
Level of Service	C	C	D	A	D	D
Approach Delay (s)	24.5			14.9	36.3	
Approach LOS	C			B	D	

Intersection Summary			
Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	43	1424	1251	0	1100	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	237	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	44	1468	1290	0	1134	141
RTOR Reduction (vph)	0	0	0	0	0	23
Lane Group Flow (vph)	44	1468	1290	0	1134	118
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	54.7	54.7	54.7		37.8	37.8
Effective Green, g (s)	54.7	54.7	54.7		37.8	37.8
Actuated g/C Ratio	0.55	0.55	0.55		0.38	0.38
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	129	1974	1974		1323	610
v/s Ratio Prot		c0.41	0.36		c0.32	
v/s Ratio Perm	0.19					0.07
v/c Ratio	0.34	0.74	0.65		0.86	0.19
Uniform Delay, d1	12.6	17.3	16.0		28.6	20.9
Progression Factor	0.27	0.48	1.14		0.90	0.99
Incremental Delay, d2	4.3	1.6	1.5		5.3	0.1
Delay (s)	7.7	9.8	19.7		31.2	20.7
Level of Service	A	A	B		C	C
Approach Delay (s)		9.8	19.7		30.1	
Approach LOS		A	B		C	

Intersection Summary			
Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2006	507	64	1938	264	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.05	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	101	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2180	551	70	2107	287	110
RTOR Reduction (vph)	0	52	0	0	0	18
Lane Group Flow (vph)	2180	499	70	2107	287	92
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	75.0	75.0	75.0	75.0	16.0	16.0
Effective Green, g (s)	75.0	75.0	75.0	75.0	16.0	16.0
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.16	0.16
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2707	1211	75	3890	560	258
v/s Ratio Prot	0.60			0.41	c0.08	
v/s Ratio Perm		0.31	c0.69			0.06
v/c Ratio	0.81	0.41	0.93	0.54	0.51	0.36
Uniform Delay, d1	7.9	4.5	10.4	5.3	38.4	37.4
Progression Factor	0.78	0.98	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.7	86.5	0.5	3.3	3.8
Delay (s)	7.9	5.1	96.9	5.8	41.8	41.3
Level of Service	A	A	F	A	D	D
Approach Delay (s)	7.4			8.7	41.6	
Approach LOS	A			A	D	

Intersection Summary			
Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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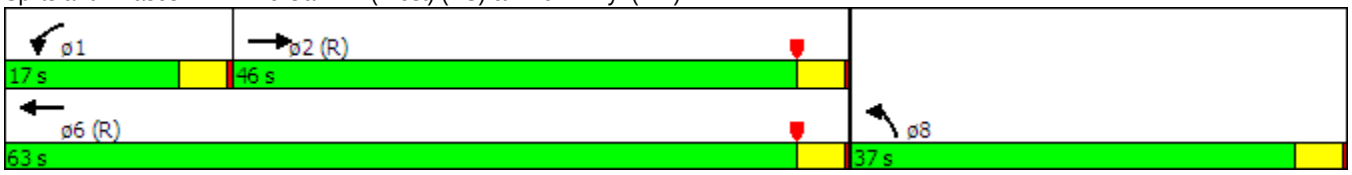
APPENDIX L:

INTERIM YEAR (2017) WITH PROJECT CONDITIONS INTERSECTION ANALYSIS WORKSHEETS

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	595	0	259	1717	945	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	46.0		17.0	63.0	37.0	
Total Split (%)	46.0%		17.0%	63.0%	37.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	595	0	259	1717	945	252
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	647	0	282	1866	1027	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1682	0	347	2183	1107	509
Arrive On Green	0.47	0.00	0.20	1.00	0.32	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	647	0	282	1866	1027	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	11.7	0.0	7.7	0.0	28.3	0.0
Cycle Q Clear(g_c), s	11.7	0.0	7.7	0.0	28.3	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1682	0	347	2183	1107	509
V/C Ratio(X)	0.38	0.00	0.81	0.85	0.93	0.00
Avail Cap(c_a), veh/h	1682	0	456	2183	1158	533
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.4	0.0	39.2	0.0	33.1	0.0
Incr Delay (d2), s/veh	0.7	0.0	6.8	4.5	12.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	5.9	0.0	4.0	1.4	15.6	0.0
LnGrp Delay(d),s/veh	18.0	0.0	46.0	4.5	45.6	0.0
LnGrp LOS	B		D	A	D	
Approach Vol, veh/h	647			2148	1027	
Approach Delay, s/veh	18.0			10.0	45.6	
Approach LOS	B			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.9	50.6				64.5		35.5
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	13.0	42.0				59.0		33.0
Max Q Clear Time (g_c+I1), s	9.7	13.7				2.0		30.3
Green Ext Time (p_c), s	0.2	26.8				51.4		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	20.9
HCM 2010 LOS	C

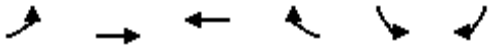
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	294	540	1896	661	193	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	16.0	69.5	53.5	53.5	30.5	30.5
Total Split (%)	16.0%	69.5%	53.5%	53.5%	30.5%	30.5%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	294	540	1896	661	193	124
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	320	587	2061	718	210	135
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	235	2830	2253	1008	389	179
Arrive On Green	0.26	1.00	1.00	1.00	0.11	0.11
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	320	587	2061	718	210	135
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	13.0	0.0	0.0	0.0	5.7	8.1
Cycle Q Clear(g_c), s	13.0	0.0	0.0	0.0	5.7	8.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	235	2830	2253	1008	389	179
V/C Ratio(X)	1.36	0.21	0.91	0.71	0.54	0.75
Avail Cap(c_a), veh/h	235	2830	2253	1008	913	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.44	0.44	1.00	1.00
Uniform Delay (d), s/veh	37.0	0.0	0.0	0.0	42.0	43.1
Incr Delay (d2), s/veh	187.2	0.2	3.5	1.9	1.2	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	18.6	0.1	1.1	0.5	2.8	7.4
LnGrp Delay(d),s/veh	224.2	0.2	3.5	1.9	43.2	49.4
LnGrp LOS	F	A	A	A	D	D
Approach Vol, veh/h		907	2779		345	
Approach Delay, s/veh		79.2	3.1		45.6	
Approach LOS		E	A		D	

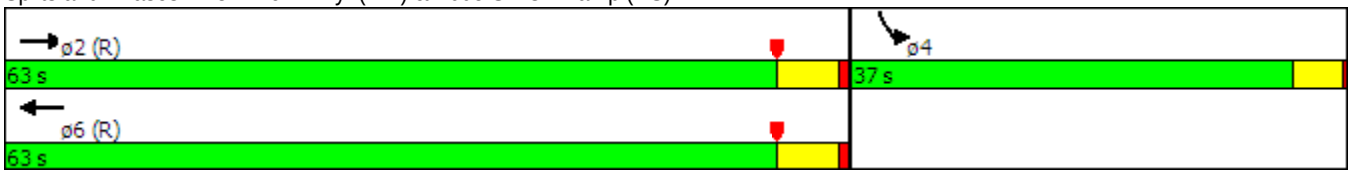
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		84.4		15.6	16.0	68.4		
Change Period (Y+Rc), s		6.0		4.5	3.0	6.0		
Max Green Setting (Gmax), s		63.5		26.0	13.0	47.5		
Max Q Clear Time (g_c+I1), s		2.0		10.1	15.0	2.0		
Green Ext Time (p_c), s		59.8		1.0	0.0	44.5		

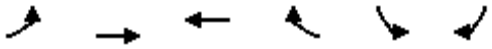
Intersection Summary	
HCM 2010 Ctrl Delay	23.8
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	723	1899	0	552	652
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		63.0	63.0		37.0	
Total Split (%)		63.0%	63.0%		37.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

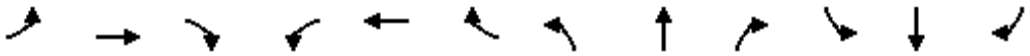




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	723	1899	0	552	652
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	769	2020	0	587	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	2983	2076	0	595	531
Arrive On Green	0.00	1.00	0.57	0.00	0.33	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	769	2020	0	587	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	54.0	0.0	32.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	54.0	0.0	32.2	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	2983	2076	0	595	531
V/C Ratio(X)	0.00	0.26	0.97	0.00	0.99	0.00
Avail Cap(c_a), veh/h	0	2983	2076	0	595	531
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.97	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	20.5	0.0	33.3	0.0
Incr Delay (d2), s/veh	0.0	0.2	14.4	0.0	33.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.1	30.8	0.0	21.5	0.0
LnGrp Delay(d),s/veh	0.0	0.2	34.9	0.0	66.5	0.0
LnGrp LOS		A	C		E	
Approach Vol, veh/h		769	2020		587	
Approach Delay, s/veh		0.2	34.9		66.5	
Approach LOS		A	C		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		63.0		37.0		63.0		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		57.5		32.9		57.5		
Max Q Clear Time (g_c+I1), s		2.0		34.2		56.0		
Green Ext Time (p_c), s		55.3		0.0		1.5		

Intersection Summary	
HCM 2010 Ctrl Delay	32.5
HCM 2010 LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	896	30	0	1899	469	0	0	31	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	896	30	0	1899	469	0	0	31	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	933	31	0	1978	489	0	0	32	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1978	0	0	933	0	0	1922	2911	467
Stage 1	-	-	-	-	-	-	933	933	-
Stage 2	-	-	-	-	-	-	989	1978	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	296	-	-	742	-	0	60	16	548
Stage 1	-	-	-	-	-	0	348	348	-
Stage 2	-	-	-	-	-	0	325	108	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	296	-	-	742	-	-	60	0	548
Mov Cap-2 Maneuver	-	-	-	-	-	-	60	0	-
Stage 1	-	-	-	-	-	-	348	0	-
Stage 2	-	-	-	-	-	-	325	0	-

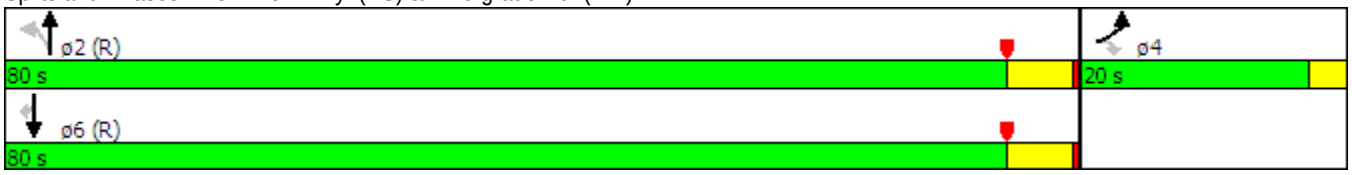
Approach	EB	WB	NB
HCM Control Delay, s	0	0	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	548	296	-	-	742	-
HCM Lane V/C Ratio	0.059	-	-	-	-	-
HCM Control Delay (s)	12	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	239	112	131	2173	678	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			350	1292	
Travel Time (s)	15.2			5.3	19.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	20.0	20.0	80.0	80.0	80.0	80.0
Total Split (%)	20.0%	20.0%	80.0%	80.0%	80.0%	80.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 5 (5%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	239	112	131	2173	678	305
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	260	122	142	2362	737	332
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	356	164	483	2937	2937	1314
Arrive On Green	0.10	0.10	1.00	1.00	0.81	0.81
Sat Flow, veh/h	3510	1615	536	3705	3705	1615
Grp Volume(v), veh/h	260	122	142	2362	737	332
Grp Sat Flow(s),veh/h/ln	1755	1615	536	1805	1805	1615
Q Serve(g_s), s	7.2	7.3	2.3	0.0	4.8	4.8
Cycle Q Clear(g_c), s	7.2	7.3	7.1	0.0	4.8	4.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	356	164	483	2937	2937	1314
V/C Ratio(X)	0.73	0.74	0.29	0.80	0.25	0.25
Avail Cap(c_a), veh/h	597	275	483	2937	2937	1314
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	43.7	0.2	0.0	2.2	2.2
Incr Delay (d2), s/veh	2.7	6.1	1.5	2.5	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.6	3.6	0.5	1.0	2.4	2.3
LnGrp Delay(d),s/veh	46.3	49.8	1.8	2.5	2.4	2.7
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	382			2504	1069	
Approach Delay, s/veh	47.4			2.4	2.5	
Approach LOS	D			A	A	

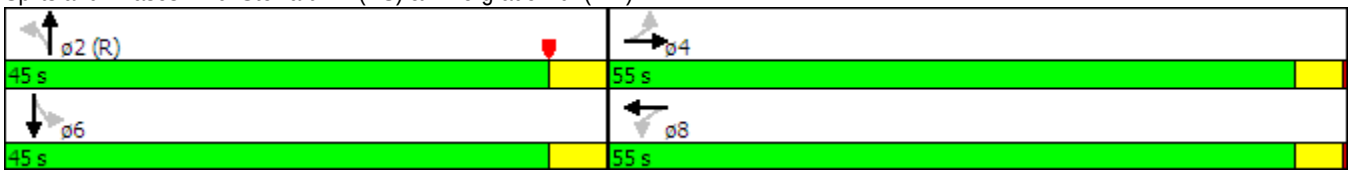
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		86.9		13.1		86.9		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		74.5		17.0		74.5		
Max Q Clear Time (g_c+I1), s		9.1		9.3		6.8		
Green Ext Time (p_c), s		50.9		0.8		52.2		

Intersection Summary	
HCM 2010 Ctrl Delay	6.8
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	213	10	97	374	12	10	9	93	8	6	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	55.0	55.0		55.0	55.0		45.0	45.0		45.0	45.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		45.0%	45.0%		45.0%	45.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	213	10	97	374	12	10	9	93	8	6	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	26	239	11	109	420	13	11	10	104	9	7	16
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	177	749	34	250	762	24	1064	101	1048	332	267	552
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.70	0.70	0.70	0.70	0.70	0.70
Sat Flow, veh/h	970	3515	161	1148	3575	110	1410	144	1493	407	380	786
Grp Volume(v), veh/h	26	122	128	109	212	221	11	0	114	32	0	0
Grp Sat Flow(s),veh/h/ln	970	1805	1872	1148	1805	1881	1410	0	1637	1573	0	0
Q Serve(g_s), s	2.5	5.7	5.8	8.9	10.5	10.5	0.0	0.0	2.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	13.0	5.7	5.8	14.6	10.5	10.5	0.2	0.0	2.2	0.6	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.06	1.00		0.91	0.28		0.50
Lane Grp Cap(c), veh/h	177	385	399	250	385	401	1064	0	1149	1150	0	0
V/C Ratio(X)	0.15	0.32	0.32	0.44	0.55	0.55	0.01	0.00	0.10	0.03	0.00	0.00
Avail Cap(c_a), veh/h	465	921	954	591	921	959	1064	0	1149	1150	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	0.98	0.98	0.98	0.63	0.00	0.63	1.00	0.00	0.00
Uniform Delay (d), s/veh	40.9	33.2	33.2	39.4	35.1	35.1	4.5	0.0	4.8	4.5	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.4	0.4	1.2	1.2	1.2	0.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	2.9	3.0	2.9	5.4	5.6	0.1	0.0	1.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	41.2	33.6	33.6	40.6	36.3	36.3	4.5	0.0	4.9	4.6	0.0	0.0
LnGrp LOS	D	C	C	D	D	D	A		A	A		
Approach Vol, veh/h		276			542			125			32	
Approach Delay, s/veh		34.3			37.1			4.8			4.6	
Approach LOS		C			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		74.7		25.3		74.7		25.3
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		40.5		51.0		40.5		51.0
Max Q Clear Time (g_c+I1), s		4.2		15.0		2.6		16.6
Green Ext Time (p_c), s		0.6		4.7		0.6		4.7

Intersection Summary	
HCM 2010 Ctrl Delay	31.1
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	335	674	813	1553	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	25.0		75.0	100.0		
Total Split (%)	25.0%		75.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



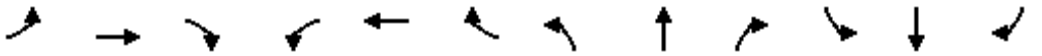
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	335	674	813	1553	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	356	0	865	1652		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.94	0.94	0.94	0.94		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	823	368	1256	3531		
Arrive On Green	0.23	0.00	1.00	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	356	0	865	1652		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	8.4	0.0	0.0	0.0		
Cycle Q Clear(g_c), s	8.4	0.0	0.0	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	823	368	1256	3531		
V/C Ratio(X)	0.43	0.00	0.69	0.47		
Avail Cap(c_a), veh/h	823	368	1256	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	33.1	0.0	0.0	0.0		
Incr Delay (d2), s/veh	1.7	0.0	3.1	0.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	4.4	0.0	1.1	0.2		
LnGrp Delay(d),s/veh	34.7	0.0	3.1	0.4		
LnGrp LOS	C		A	A		
Approach Vol, veh/h	356			2517		
Approach Delay, s/veh	34.7			1.4		
Approach LOS	C			A		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	75.0	28.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	69.4	* 20				94.4		
Max Q Clear Time (g_c+I1), s	2.0	10.4				2.0		
Green Ext Time (p_c), s	10.8	8.5				60.0		

Intersection Summary	
HCM 2010 Ctrl Delay	5.5
HCM 2010 LOS	A

Notes

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	335	0	0	1621	0	0	0	796	0	0	745
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	155.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	335	0	0	1621	0	0	0	796	0	0	745
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	345	0	0	1671	0	0	0	821	0	0	768

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1671	0	0	345	0	0	1181	2016	173	1844	2016	836
Stage 1	-	-	-	-	-	-	345	345	-	1671	1671	-
Stage 2	-	-	-	-	-	-	836	1671	-	173	345	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	389	-	-	1225	-	-	148	59	847	47	59	~ 315
Stage 1	-	-	-	-	-	-	649	640	-	102	154	-
Stage 2	-	-	-	-	-	-	332	154	-	818	640	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	389	-	-	1225	-	-	-	59	847	1	59	~ 315
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	59	-	1	59	-
Stage 1	-	-	-	-	-	-	649	640	-	102	154	-
Stage 2	-	-	-	-	-	-	-	154	-	25	640	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	45.9	$ 682.5
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	847	389	-	-	1225	-	-	315
HCM Lane V/C Ratio	0.969	-	-	-	-	-	-	2.438
HCM Control Delay (s)	45.9	0	-	-	0	-	-	$ 682.5
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	16	0	-	-	0	-	-	61.3

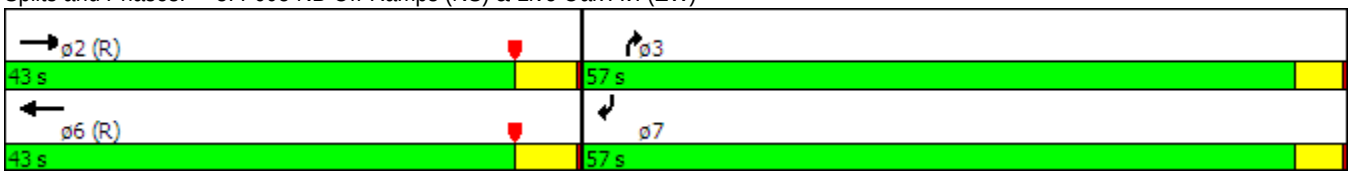
Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	335	0	0	1621	0	0	0	796	0	0	745
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Detector Phase		2			6				3			7
Switch Phase												
Minimum Initial (s)		10.0			10.0				4.0			4.0
Minimum Split (s)		21.0			21.0				8.0			8.0
Total Split (s)		43.0			43.0				57.0			57.0
Total Split (%)		43.0%			43.0%				57.0%			57.0%
Yellow Time (s)		4.5			4.5				3.5			3.5
All-Red Time (s)		0.5			0.5				0.5			0.5
Lost Time Adjust (s)		0.0			0.0				0.0			0.0
Total Lost Time (s)		5.0			5.0				4.0			4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max				None			None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	335	0	0	1621	0	0	0	796	0	0	745
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	0	0	1900	0	0	0	1900	0	0	1900
Adj Flow Rate, veh/h	0	345	0	0	1671	0	0	0	821	0	0	768
Adj No. of Lanes	0	2	0	0	3	0	0	0	2	0	0	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	3430	0	0	4928	0	0	0	0	0	0	0
Arrive On Green	0.00	0.31	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	3800	0	0	5529	0		0			0	
Grp Volume(v), veh/h	0	345	0	0	1671	0		0.0			0.0	
Grp Sat Flow(s),veh/h/ln	0	1805	0	0	1729	0						
Q Serve(g_s), s	0.0	6.8	0.0	0.0	2.4	0.0						
Cycle Q Clear(g_c), s	0.0	6.8	0.0	0.0	2.4	0.0						
Prop In Lane	0.00		0.00	0.00		0.00						
Lane Grp Cap(c), veh/h	0	3430	0	0	4928	0						
V/C Ratio(X)	0.00	0.10	0.00	0.00	0.34	0.00						
Avail Cap(c_a), veh/h	0	3430	0	0	4928	0						
HCM Platoon Ratio	1.00	0.33	1.00	1.00	1.00	1.00						
Upstream Filter(I)	0.00	0.85	0.00	0.00	0.77	0.00						
Uniform Delay (d), s/veh	0.0	4.0	0.0	0.0	0.2	0.0						
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(-26165%),veh/ln	0.0	3.4	0.0	0.0	1.0	0.0						
LnGrp Delay(d),s/veh	0.0	4.1	0.0	0.0	0.3	0.0						
LnGrp LOS		A			A							
Approach Vol, veh/h		345			1671							
Approach Delay, s/veh		4.1			0.3							
Approach LOS		A			A							

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		
Phs Duration (G+Y+Rc), s		100.0				100.0		
Change Period (Y+Rc), s		5.0				5.0		
Max Green Setting (Gmax), s		38.0				38.0		
Max Q Clear Time (g_c+I1), s		8.8				4.4		
Green Ext Time (p_c), s		23.4				26.1		

Intersection Summary	
HCM 2010 Ctrl Delay	1.0
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1026	105	47	1470	151	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	62.0	62.0	10.0	72.0	28.0	
Total Split (%)	62.0%	62.0%	10.0%	72.0%	28.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



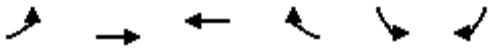
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1026	105	47	1470	151	57
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	1115	114	51	1598	164	62
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2555	1143	66	2795	191	72
Arrive On Green	0.47	0.47	0.02	0.52	0.15	0.15
Sat Flow, veh/h	3705	1615	1810	3705	1266	479
Grp Volume(v), veh/h	1115	114	51	1598	227	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1752	0
Q Serve(g_s), s	20.5	3.9	2.8	30.3	12.6	0.0
Cycle Q Clear(g_c), s	20.5	3.9	2.8	30.3	12.6	0.0
Prop In Lane		1.00	1.00		0.72	0.27
Lane Grp Cap(c), veh/h	2555	1143	66	2795	264	0
V/C Ratio(X)	0.44	0.10	0.77	0.57	0.86	0.00
Avail Cap(c_a), veh/h	2555	1143	127	2795	438	0
HCM Platoon Ratio	0.67	0.67	0.67	0.67	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.1	8.7	48.4	12.7	41.4	0.0
Incr Delay (d2), s/veh	0.5	0.2	7.0	0.9	8.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	10.4	1.8	1.5	15.4	6.8	0.0
LnGrp Delay(d),s/veh	13.6	8.9	55.4	13.6	50.3	0.0
LnGrp LOS	B	A	E	B	D	
Approach Vol, veh/h	1229			1649	227	
Approach Delay, s/veh	13.2			14.9	50.3	
Approach LOS	B			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.6	75.3				81.9		18.1
Change Period (Y+Rc), s	3.0	4.5				4.5		3.0
Max Green Setting (Gmax), s	7.0	57.5				67.5		25.0
Max Q Clear Time (g_c+I1), s	4.8	22.5				32.3		14.6
Green Ext Time (p_c), s	0.0	31.6				31.7		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	16.8
HCM 2010 LOS	B

Notes

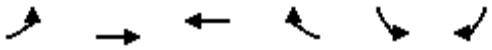
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	85	1003	1405	54	13	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	85	1003	1405	54	13	131
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	89	1056	1479	57	14	138
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.71				0.81	0.71
vC, conflicting volume	1536				2186	739
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	951				973	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	83				92	82
cM capacity (veh/h)	522				169	780

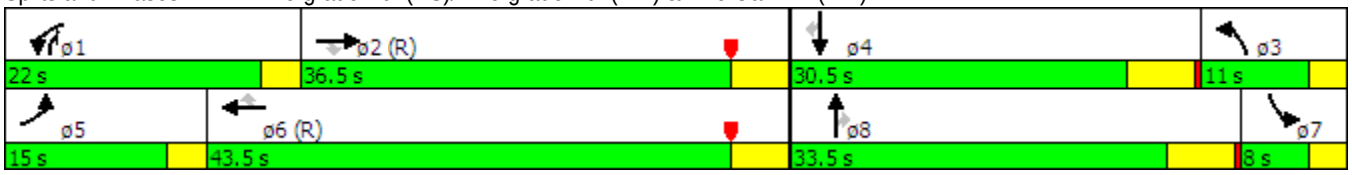
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	89	528	528	739	739	57	152
Volume Left	89	0	0	0	0	0	14
Volume Right	0	0	0	0	0	57	138
cSH	522	1700	1700	1700	1700	1700	588
Volume to Capacity	0.17	0.31	0.31	0.43	0.43	0.03	0.26
Queue Length 95th (ft)	15	0	0	0	0	0	26
Control Delay (s)	13.3	0.0	0.0	0.0	0.0	0.0	13.2
Lane LOS	B						B
Approach Delay (s)	1.0			0.0			13.2
Approach LOS							B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	184	734	90	258	1217	13	51	52	111	30	77	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	15.0	36.5	36.5	22.0	43.5	43.5	11.0	33.5	22.0	8.0	30.5	30.5
Total Split (%)	15.0%	36.5%	36.5%	22.0%	43.5%	43.5%	11.0%	33.5%	22.0%	8.0%	30.5%	30.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	184	734	90	258	1217	13	51	52	111	30	77	175
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	200	798	0	280	1323	14	55	57	121	33	84	190
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	217	1833	820	305	2009	899	71	143	394	160	449	201
Arrive On Green	0.04	0.17	0.00	0.34	1.00	1.00	0.04	0.08	0.08	0.15	0.21	0.21
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	200	798	0	280	1323	14	55	57	121	33	84	190
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	11.0	19.8	0.0	14.8	0.0	0.0	3.0	2.9	4.5	1.6	1.9	8.9
Cycle Q Clear(g_c), s	11.0	19.8	0.0	14.8	0.0	0.0	3.0	2.9	4.5	1.6	1.9	8.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	217	1833	820	305	2009	899	71	143	394	160	449	201
V/C Ratio(X)	0.92	0.44	0.00	0.92	0.66	0.02	0.77	0.40	0.31	0.21	0.19	0.95
Avail Cap(c_a), veh/h	217	1833	820	344	2009	899	145	532	725	160	903	404
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	0.00	0.45	0.45	0.45	1.00	1.00	1.00	0.73	0.73	0.73
Uniform Delay (d), s/veh	47.5	28.7	0.0	32.5	0.0	0.0	47.6	44.1	17.3	39.5	35.5	23.0
Incr Delay (d2), s/veh	39.3	0.8	0.0	14.1	0.8	0.0	6.5	3.1	0.7	0.2	0.2	22.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	7.9	10.2	0.0	8.5	0.2	0.0	1.6	1.6	2.1	0.8	1.0	5.2
LnGrp Delay(d),s/veh	86.8	29.5	0.0	46.6	0.8	0.0	54.1	47.2	18.0	39.7	35.7	45.3
LnGrp LOS	F	C		D	A	A	D	D	B	D	D	D
Approach Vol, veh/h		998			1617			233			307	
Approach Delay, s/veh		41.0			8.7			33.7			42.1	
Approach LOS		D			A			C			D	

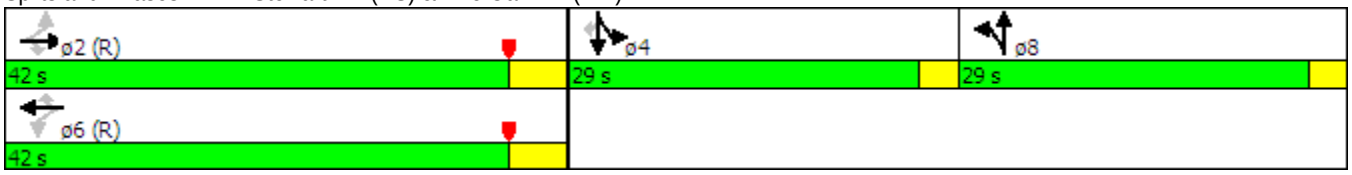
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.9	55.3	6.9	17.9	15.0	60.1	11.8	13.0
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	19.0	32.0	8.0	25.0	12.0	39.0	5.0	28.0
Max Q Clear Time (g_c+I1), s	16.8	21.8	5.0	10.9	13.0	2.0	3.6	6.5
Green Ext Time (p_c), s	0.0	9.0	0.0	1.6	0.0	27.0	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	24.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	679	31	19	1561	39	224	123	38	13	30	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	679	31	19	1561	39	224	123	38	13	30	78
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	21	738	34	21	1697	42	243	134	41	14	33	85
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	150	2069	926	478	2069	926	262	145	44	133	139	118
Arrive On Green	1.00	1.00	1.00	0.76	0.76	0.76	0.25	0.25	0.25	0.07	0.07	0.07
Sat Flow, veh/h	282	3610	1615	709	3610	1615	1056	582	178	1810	1900	1615
Grp Volume(v), veh/h	21	738	34	21	1697	42	418	0	0	14	33	85
Grp Sat Flow(s),veh/h/ln	282	1805	1615	709	1805	1615	1816	0	0	1810	1900	1615
Q Serve(g_s), s	4.4	0.0	0.0	0.7	29.8	0.6	22.5	0.0	0.0	0.7	1.6	5.1
Cycle Q Clear(g_c), s	34.3	0.0	0.0	0.7	29.8	0.6	22.5	0.0	0.0	0.7	1.6	5.1
Prop In Lane	1.00		1.00	1.00		1.00	0.58		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	150	2069	926	478	2069	926	451	0	0	133	139	118
V/C Ratio(X)	0.14	0.36	0.04	0.04	0.82	0.05	0.93	0.00	0.00	0.11	0.24	0.72
Avail Cap(c_a), veh/h	150	2069	926	478	2069	926	472	0	0	470	494	420
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	0.53	0.53	0.53	1.00	0.00	0.00	0.88	0.88	0.88
Uniform Delay (d), s/veh	8.9	0.0	0.0	5.2	8.6	5.1	36.7	0.0	0.0	43.3	43.7	45.3
Incr Delay (d2), s/veh	1.8	0.4	0.1	0.1	2.1	0.0	23.9	0.0	0.0	0.3	0.8	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.4	0.1	0.0	0.2	14.8	0.3	14.3	0.0	0.0	0.4	0.9	2.5
LnGrp Delay(d),s/veh	10.7	0.4	0.1	5.3	10.7	5.2	60.5	0.0	0.0	43.6	44.5	52.3
LnGrp LOS	B	A	A	A	B	A	E			D	D	D
Approach Vol, veh/h		793			1760			418			132	
Approach Delay, s/veh		0.7			10.5			60.5			49.4	
Approach LOS		A			B			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		61.8		10.3		61.8		27.9
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		36.3		7.1		31.8		24.5
Green Ext Time (p_c), s		1.1		0.4		4.7		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	540	65	137	1415	43	305	10	299	12	4	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		50	200		0	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	60			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1141			511			1039			220	
Travel Time (s)		17.3			7.7			23.6			5.0	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Detector Phase	5	2	2	1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	10.0	10.0		4.0	4.0	
Minimum Split (s)	8.0	20.5	20.5	8.0	20.0	20.0	20.5	20.5		8.0	20.0	
Total Split (s)	8.0	40.5	40.5	19.0	51.5	51.5	20.5	32.5		8.0	20.0	
Total Split (%)	8.0%	40.5%	40.5%	19.0%	51.5%	51.5%	20.5%	32.5%		8.0%	20.0%	
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5		3.5	3.5	
All-Red Time (s)	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	43	540	65	137	1415	43	305	10	299	12	4	19
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	47	587	71	149	1538	47	332	11	325	13	4	21
Adj No. of Lanes	1	2	1	1	2	1	2	1	0	1	1	0
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	60	1585	709	179	1822	815	562	15	440	22	34	177
Arrive On Green	0.07	0.88	0.88	0.20	1.00	1.00	0.16	0.28	0.28	0.01	0.13	0.13
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	3510	53	1570	1810	265	1390
Grp Volume(v), veh/h	47	587	71	149	1538	47	332	0	336	13	0	25
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1755	0	1623	1810	0	1655
Q Serve(g_s), s	2.6	2.9	0.6	7.9	0.0	0.0	8.8	0.0	18.8	0.7	0.0	1.3
Cycle Q Clear(g_c), s	2.6	2.9	0.6	7.9	0.0	0.0	8.8	0.0	18.8	0.7	0.0	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.84
Lane Grp Cap(c), veh/h	60	1585	709	179	1822	815	562	0	454	22	0	210
V/C Ratio(X)	0.78	0.37	0.10	0.83	0.84	0.06	0.59	0.00	0.74	0.59	0.00	0.12
Avail Cap(c_a), veh/h	72	1585	709	271	1822	815	562	0	454	72	0	265
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.80	0.80	0.80	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.3	3.6	3.5	39.3	0.0	0.0	39.0	0.0	32.7	49.1	0.0	38.7
Incr Delay (d2), s/veh	33.8	0.6	0.3	10.3	4.1	0.1	4.5	0.0	10.3	22.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.8	1.4	0.3	4.4	1.0	0.0	4.6	0.0	9.7	0.5	0.0	0.6
LnGrp Delay(d),s/veh	80.1	4.2	3.7	49.6	4.1	0.1	43.5	0.0	43.0	72.1	0.0	38.9
LnGrp LOS	F	A	A	D	A	A	D		D	E		D
Approach Vol, veh/h		705			1734			668			38	
Approach Delay, s/veh		9.2			7.9			43.2			50.3	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	48.4	20.5	17.2	7.3	55.0	5.2	32.5
Change Period (Y+Rc), s	4.0	4.5	4.5	* 4.5	4.0	4.5	4.0	4.5
Max Green Setting (Gmax), s	15.0	36.0	16.0	* 16	4.0	47.0	4.0	28.0
Max Q Clear Time (g_c+I1), s	9.9	4.9	10.8	3.3	4.6	2.0	2.7	20.8
Green Ext Time (p_c), s	0.1	26.3	0.9	2.8	0.0	35.8	0.0	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

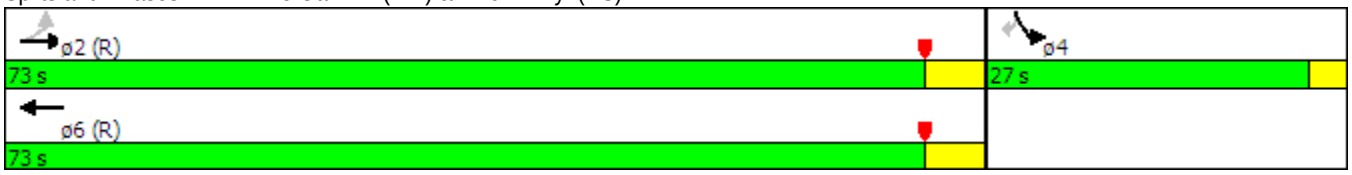
Notes

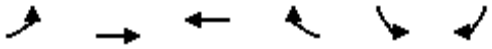
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	111	739	1496	0	469	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	20.0	20.0	28.5		27.0	27.0
Total Split (s)	73.0	73.0	73.0		27.0	27.0
Total Split (%)	73.0%	73.0%	73.0%		27.0%	27.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 33 (33%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	111	739	1496	0	469	98
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	114	762	1542	0	484	101
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	269	2735	2735	0	588	270
Arrive On Green	1.00	1.00	0.76	0.00	0.17	0.17
Sat Flow, veh/h	341	3705	3800	0	3510	1615
Grp Volume(v), veh/h	114	762	1542	0	484	101
Grp Sat Flow(s),veh/h/ln	341	1805	1805	0	1755	1615
Q Serve(g_s), s	14.3	0.0	18.1	0.0	13.3	5.6
Cycle Q Clear(g_c), s	32.3	0.0	18.1	0.0	13.3	5.6
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	269	2735	2735	0	588	270
V/C Ratio(X)	0.42	0.28	0.56	0.00	0.82	0.37
Avail Cap(c_a), veh/h	269	2735	2735	0	843	388
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	3.9	0.0	5.1	0.0	40.2	37.0
Incr Delay (d2), s/veh	4.4	0.2	0.8	0.0	4.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.6	0.1	9.1	0.0	6.8	2.5
LnGrp Delay(d),s/veh	8.3	0.2	6.0	0.0	44.7	37.8
LnGrp LOS	A	A	A		D	D
Approach Vol, veh/h		876	1542		585	
Approach Delay, s/veh		1.3	6.0		43.5	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		80.3		19.7		80.3		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		68.5		24.0		68.5		
Max Q Clear Time (g_c+I1), s		34.3		15.3		20.1		
Green Ext Time (p_c), s		30.7		1.4		41.8		

Intersection Summary	
HCM 2010 Ctrl Delay	11.9
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	903	118	35	2806	638	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	71.0	71.0	71.0	71.0	29.0	29.0
Total Split (%)	71.0%	71.0%	71.0%	71.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	903	118	35	2806	638	106
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	982	128	38	3050	693	115
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2383	1066	347	3423	878	404
Arrive On Green	0.66	0.66	0.66	0.66	0.25	0.25
Sat Flow, veh/h	3705	1615	516	5358	3510	1615
Grp Volume(v), veh/h	982	128	38	3050	693	115
Grp Sat Flow(s),veh/h/ln	1805	1615	516	1729	1755	1615
Q Serve(g_s), s	12.7	2.9	3.7	48.5	18.4	5.8
Cycle Q Clear(g_c), s	12.7	2.9	16.4	48.5	18.4	5.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2383	1066	347	3423	878	404
V/C Ratio(X)	0.41	0.12	0.11	0.89	0.79	0.28
Avail Cap(c_a), veh/h	2383	1066	347	3423	878	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.9	6.3	11.8	14.0	35.0	30.3
Incr Delay (d2), s/veh	0.5	0.2	0.6	4.0	7.2	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	6.4	1.3	0.6	24.1	9.8	2.8
LnGrp Delay(d),s/veh	8.5	6.5	12.4	18.0	42.2	32.0
LnGrp LOS	A	A	B	B	D	C
Approach Vol, veh/h	1110			3088	808	
Approach Delay, s/veh	8.2			17.9	40.8	
Approach LOS	A			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		71.0				71.0		29.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		66.0				66.0		25.0
Max Q Clear Time (g_c+I1), s		14.7				50.5		20.4
Green Ext Time (p_c), s		51.0				15.4		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.5
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	255	12	10	2048	555	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			100
Storage Lanes	1	1	1			0
Taper Length (ft)	25		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			45	45	
Link Distance (ft)	296			257	167	
Travel Time (s)	6.7			3.9	2.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	26.0	26.0	8.0	74.0	66.0	66.0
Total Split (%)	26.0%	26.0%	8.0%	74.0%	66.0%	66.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 16: Arrow Hwy. (NS) & Driveway 1 (EW)





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	255	12	10	2048	555	170
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	268	13	11	2156	584	179
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	305	272	19	2713	2530	1132
Arrive On Green	0.17	0.17	0.01	0.75	1.00	1.00
Sat Flow, veh/h	1810	1615	1810	3705	3705	1615
Grp Volume(v), veh/h	268	13	11	2156	584	179
Grp Sat Flow(s),veh/h/ln	1810	1615	1810	1805	1805	1615
Q Serve(g_s), s	14.5	0.7	0.6	36.9	0.0	0.0
Cycle Q Clear(g_c), s	14.5	0.7	0.6	36.9	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	305	272	19	2713	2530	1132
V/C Ratio(X)	0.88	0.05	0.58	0.79	0.23	0.16
Avail Cap(c_a), veh/h	398	355	72	2713	2530	1132
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	34.8	49.3	7.7	0.0	0.0
Incr Delay (d2), s/veh	16.1	0.1	24.7	2.5	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	8.6	0.7	0.4	18.9	0.1	0.1
LnGrp Delay(d),s/veh	56.7	34.9	73.9	10.2	0.2	0.3
LnGrp LOS	E	C	E	B	A	A
Approach Vol, veh/h	281			2167	763	
Approach Delay, s/veh	55.6			10.5	0.2	
Approach LOS	E			B	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		79.1		20.9	5.1	74.1		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		70.0		22.0	4.0	62.0		
Max Q Clear Time (g_c+I1), s		38.9		16.5	2.6	2.0		
Green Ext Time (p_c), s		26.0		0.4	0.0	43.5		

Intersection Summary	
HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	5	2	4	2299	723	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Link Speed (mph)	30			45	45	
Link Distance (ft)	301			157	350	
Travel Time (s)	6.8			2.4	5.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	5	2	4	2299	723	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	2	4	2420	761	69

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1979	381	761	0	-	0
Stage 1	761	-	-	-	-	-
Stage 2	1218	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	55	623	860	-	-	-
Stage 1	427	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	55	623	860	-	-	-
Mov Cap-2 Maneuver	166	-	-	-	-	-
Stage 1	427	-	-	-	-	-
Stage 2	247	-	-	-	-	-

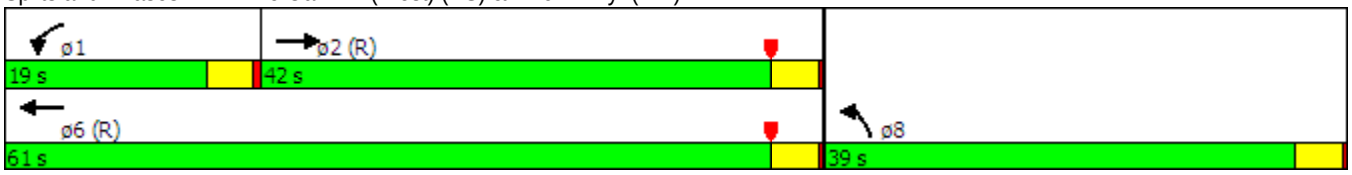
Approach	EB	NB	SB
HCM Control Delay, s	22.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	860	-	210	-	-
HCM Lane V/C Ratio	0.005	-	0.035	-	-
HCM Control Delay (s)	9.2	0	22.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	953	0	378	968	884	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	42.0		19.0	61.0	39.0	
Total Split (%)	42.0%		19.0%	61.0%	39.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	953	0	378	968	884	294
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	1036	0	411	1052	961	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1593	0	470	2221	1070	492
Arrive On Green	0.44	0.00	0.27	1.00	0.30	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	1036	0	411	1052	961	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	22.5	0.0	11.2	0.0	26.2	0.0
Cycle Q Clear(g_c), s	22.5	0.0	11.2	0.0	26.2	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1593	0	470	2221	1070	492
V/C Ratio(X)	0.65	0.00	0.87	0.47	0.90	0.00
Avail Cap(c_a), veh/h	1593	0	527	2221	1229	565
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.9	0.0	35.8	0.0	33.3	0.0
Incr Delay (d2), s/veh	2.1	0.0	13.2	0.7	8.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	11.5	0.0	6.2	0.2	13.9	0.0
LnGrp Delay(d),s/veh	24.0	0.0	49.0	0.7	41.6	0.0
LnGrp LOS	C		D	A	D	
Approach Vol, veh/h	1036			1463	961	
Approach Delay, s/veh	24.0			14.3	41.6	
Approach LOS	C			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	17.4	48.1				65.5		34.5
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	15.0	38.0				57.0		35.0
Max Q Clear Time (g_c+I1), s	13.2	24.5				2.0		28.2
Green Ext Time (p_c), s	0.2	12.4				42.5		2.3

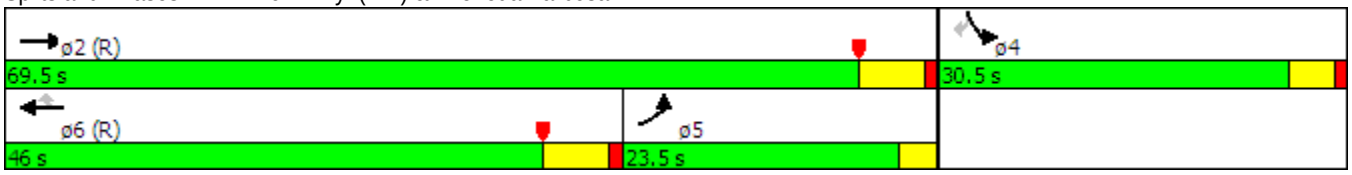
Intersection Summary	
HCM 2010 Ctrl Delay	24.8
HCM 2010 LOS	C

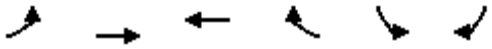
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	192	1041	1064	216	418	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	23.5	69.5	46.0	46.0	30.5	30.5
Total Split (%)	23.5%	69.5%	46.0%	46.0%	30.5%	30.5%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	192	1041	1064	216	418	316
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	209	1132	1157	235	454	343
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	359	2377	1444	646	831	382
Arrive On Green	0.40	1.00	0.80	0.80	0.24	0.24
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	209	1132	1157	235	454	343
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	9.1	0.0	17.9	4.1	11.3	20.6
Cycle Q Clear(g_c), s	9.1	0.0	17.9	4.1	11.3	20.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	359	2377	1444	646	831	382
V/C Ratio(X)	0.58	0.48	0.80	0.36	0.55	0.90
Avail Cap(c_a), veh/h	371	2377	1444	646	913	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.93	0.93	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	7.8	6.4	33.5	37.0
Incr Delay (d2), s/veh	1.4	0.7	4.5	1.5	0.6	20.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	4.5	0.2	9.2	2.0	5.6	18.9
LnGrp Delay(d),s/veh	28.3	0.7	12.2	7.9	34.0	57.4
LnGrp LOS	C	A	B	A	C	E
Approach Vol, veh/h		1341	1392		797	
Approach Delay, s/veh		5.0	11.5		44.1	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		71.8		28.2	25.8	46.0		
Change Period (Y+Rc), s		6.0		4.5	6.0	* 6		
Max Green Setting (Gmax), s		63.5		26.0	20.5	* 40		
Max Q Clear Time (g_c+I1), s		2.0		22.6	11.1	19.9		
Green Ext Time (p_c), s		21.3		1.1	6.6	14.0		

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

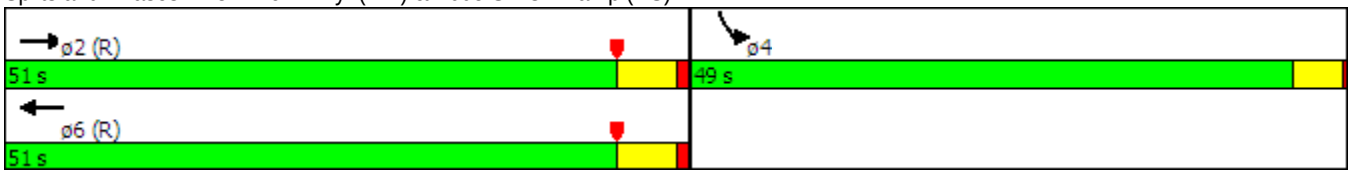
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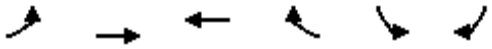
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	1449	828	0	439	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		51.0	51.0		49.0	
Total Split (%)		51.0%	51.0%		49.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

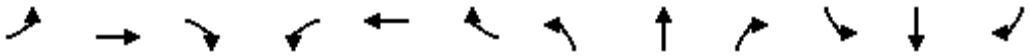




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	1449	828	0	439	438
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	1575	900	0	477	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	3190	2220	0	523	467
Arrive On Green	0.00	1.00	0.62	0.00	0.29	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	1575	900	0	477	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	12.8	0.0	25.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	12.8	0.0	25.5	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	3190	2220	0	523	467
V/C Ratio(X)	0.00	0.49	0.41	0.00	0.91	0.00
Avail Cap(c_a), veh/h	0	3190	2220	0	812	725
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.85	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	9.9	0.0	34.3	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.6	0.0	10.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.1	6.4	0.0	14.2	0.0
LnGrp Delay(d),s/veh	0.0	0.5	10.4	0.0	44.4	0.0
LnGrp LOS		A	B		D	
Approach Vol, veh/h		1575	900		477	
Approach Delay, s/veh		0.5	10.4		44.4	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		67.0		33.0		67.0		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		45.5		44.9		45.5		
Max Q Clear Time (g_c+I1), s		2.0		27.5		14.8		
Green Ext Time (p_c), s		43.0		1.4		30.4		

Intersection Summary	
HCM 2010 Ctrl Delay	10.6
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1600	15	0	828	482	0	0	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1600	15	0	828	482	0	0	33	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1702	16	0	881	513	0	0	35	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	881	0	0	1702	0	0	2142	2583	851
Stage 1	-	-	-	-	-	-	1702	1702	-
Stage 2	-	-	-	-	-	-	440	881	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	776	-	-	379	-	0	43	26	308
Stage 1	-	-	-	-	-	0	136	149	-
Stage 2	-	-	-	-	-	0	622	367	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	776	-	-	379	-	-	43	0	308
Mov Cap-2 Maneuver	-	-	-	-	-	-	43	0	-
Stage 1	-	-	-	-	-	-	136	0	-
Stage 2	-	-	-	-	-	-	622	0	-

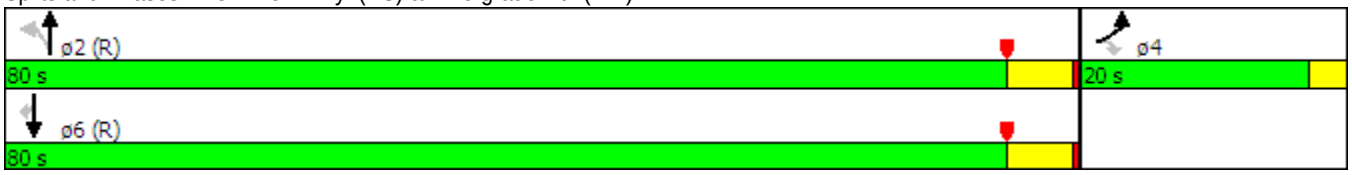
Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	308	776	-	-	379	-
HCM Lane V/C Ratio	0.114	-	-	-	-	-
HCM Control Delay (s)	18.2	0	-	-	0	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	165	138	127	1121	1375	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			350	1292	
Travel Time (s)	15.2			5.3	19.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	20.0	20.0	80.0	80.0	80.0	80.0
Total Split (%)	20.0%	20.0%	80.0%	80.0%	80.0%	80.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 5 (5%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	165	138	127	1121	1375	146
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	172	144	132	1168	1432	152
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	395	182	293	2897	2897	1296
Arrive On Green	0.11	0.11	1.00	1.00	0.80	0.80
Sat Flow, veh/h	3510	1615	328	3705	3705	1615
Grp Volume(v), veh/h	172	144	132	1168	1432	152
Grp Sat Flow(s),veh/h/ln	1755	1615	328	1805	1805	1615
Q Serve(g_s), s	4.6	8.7	13.1	0.0	13.0	2.1
Cycle Q Clear(g_c), s	4.6	8.7	26.1	0.0	13.0	2.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	395	182	293	2897	2897	1296
V/C Ratio(X)	0.44	0.79	0.45	0.40	0.49	0.12
Avail Cap(c_a), veh/h	597	275	293	2897	2897	1296
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.4	43.2	2.1	0.0	3.2	2.2
Incr Delay (d2), s/veh	0.7	8.7	5.0	0.4	0.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	2.3	4.3	1.5	0.2	6.6	1.0
LnGrp Delay(d),s/veh	42.2	51.9	7.1	0.4	3.8	2.3
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	316			1300	1584	
Approach Delay, s/veh	46.6			1.1	3.7	
Approach LOS	D			A	A	

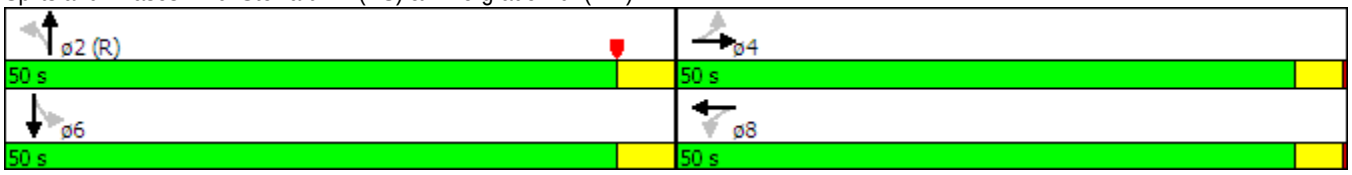
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		85.8		14.2		85.8		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		74.5		17.0		74.5		
Max Q Clear Time (g_c+I1), s		28.1		10.7		15.0		
Green Ext Time (p_c), s		36.5		0.6		44.1		

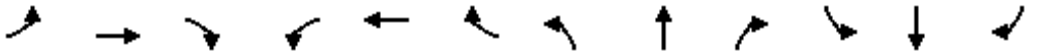
Intersection Summary	
HCM 2010 Ctrl Delay	6.9
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	253	39	306	173	4	1	2	77	5	21	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	50.0	50.0		50.0	50.0		50.0	50.0		50.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	253	39	306	173	4	1	2	77	5	21	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	3	329	51	397	225	5	1	3	100	6	27	19
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	568	1444	222	476	1661	37	708	21	717	101	438	287
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	1169	3138	482	1019	3611	80	1381	47	1575	134	963	632
Grp Volume(v), veh/h	3	188	192	397	112	118	1	0	103	52	0	0
Grp Sat Flow(s),veh/h/ln	1169	1805	1815	1019	1805	1886	1381	0	1622	1728	0	0
Q Serve(g_s), s	0.1	6.3	6.4	38.6	3.6	3.6	0.0	0.0	3.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.7	6.3	6.4	44.9	3.6	3.6	0.0	0.0	3.7	1.6	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.04	1.00		0.97	0.12		0.37
Lane Grp Cap(c), veh/h	568	830	835	476	830	868	708	0	738	827	0	0
V/C Ratio(X)	0.01	0.23	0.23	0.83	0.14	0.14	0.00	0.00	0.14	0.06	0.00	0.00
Avail Cap(c_a), veh/h	568	830	835	476	830	868	708	0	738	827	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	0.96	0.96	0.96	0.90	0.00	0.90	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.6	16.3	16.3	29.9	15.5	15.6	14.9	0.0	15.9	15.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	11.8	0.1	0.1	0.0	0.0	0.4	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	3.2	3.2	12.4	1.8	1.9	0.0	0.0	1.7	0.8	0.0	0.0
LnGrp Delay(d),s/veh	16.6	16.4	16.4	41.7	15.6	15.6	14.9	0.0	16.2	15.4	0.0	0.0
LnGrp LOS	B	B	B	D	B	B	B		B	B		
Approach Vol, veh/h		383			627			104			52	
Approach Delay, s/veh		16.4			32.1			16.2			15.4	
Approach LOS		B			C			B			B	

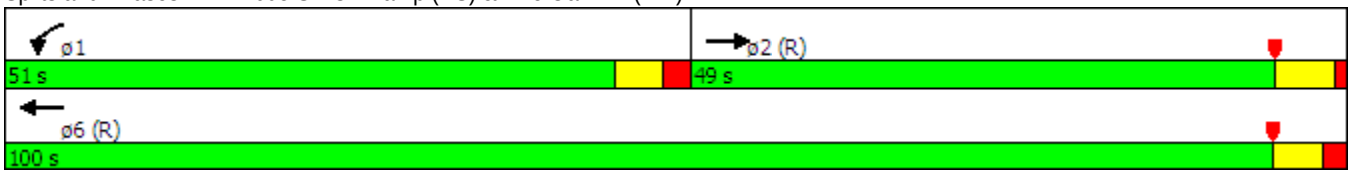
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		50.0		50.0		50.0
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		45.5		46.0		45.5		46.0
Max Q Clear Time (g_c+I1), s		5.7		8.4		3.6		46.9
Green Ext Time (p_c), s		0.6		6.1		0.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	24.8
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1339	1173	704	1536	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	49.0		51.0	100.0		
Total Split (%)	49.0%		51.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



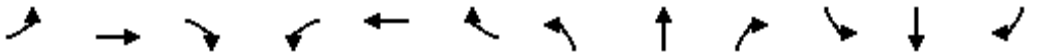
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1339	1173	704	1536	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	1440	0	757	1652		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	1689	756	822	3531		
Arrive On Green	0.47	0.00	0.91	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	1440	0	757	1652		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	35.3	0.0	23.6	0.0		
Cycle Q Clear(g_c), s	35.3	0.0	23.6	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	1689	756	822	3531		
V/C Ratio(X)	0.85	0.00	0.92	0.47		
Avail Cap(c_a), veh/h	1689	756	822	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	23.5	0.0	3.6	0.0		
Incr Delay (d2), s/veh	5.7	0.0	17.3	0.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	18.7	0.0	13.6	0.2		
LnGrp Delay(d),s/veh	29.2	0.0	20.9	0.4		
LnGrp LOS	C		C	A		
Approach Vol, veh/h	1440			2409		
Approach Delay, s/veh	29.2			6.9		
Approach LOS	C			A		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	51.0	52.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	45.4	* 44				94.4		
Max Q Clear Time (g_c+I1), s	25.6	37.3				2.0		
Green Ext Time (p_c), s	6.4	6.1				84.0		

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Notes

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	1339	0	0	1410	0	0	0	712	0	0	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	190.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1339	0	0	1410	0	0	0	712	0	0	831
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1380	0	0	1454	0	0	0	734	0	0	857

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1454	0	0	1380	0	0	2107	2834	690	2144	2834	727
Stage 1	-	-	-	-	-	-	1380	1380	-	1454	1454	-
Stage 2	-	-	-	-	-	-	727	1454	-	690	1380	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	471	-	-	503	-	-	30	18	~ 392	28	18	~ 371
Stage 1	-	-	-	-	-	-	155	214	-	139	197	-
Stage 2	-	-	-	-	-	-	386	197	-	406	214	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	471	-	-	503	-	-	-	18	~ 392	-	18	~ 371
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	18	-	-	18	-
Stage 1	-	-	-	-	-	-	155	214	-	139	197	-
Stage 2	-	-	-	-	-	-	-	197	-	-	214	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	$ 425.6	$ 620.5
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	392	471	-	-	503	-	-	371
HCM Lane V/C Ratio	1.873	-	-	-	-	-	-	2.309
HCM Control Delay (s)	$ 425.6	0	-	-	0	-	-	$ 620.5
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	48.4	0	-	-	0	-	-	65.6

Notes

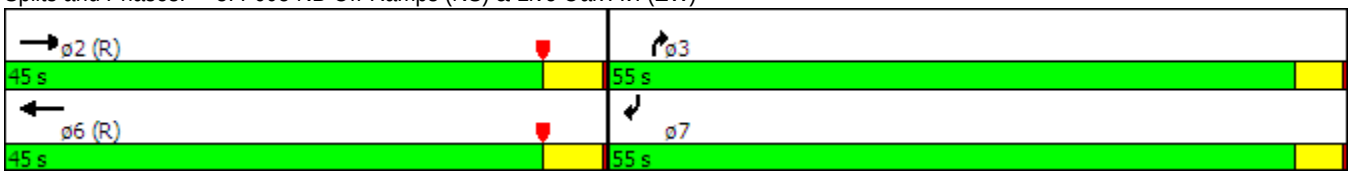
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1339	0	0	1410	0	0	0	712	0	0	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Detector Phase		2			6				3			7
Switch Phase												
Minimum Initial (s)		10.0			10.0				4.0			4.0
Minimum Split (s)		21.0			21.0				8.0			8.0
Total Split (s)		45.0			45.0				55.0			55.0
Total Split (%)		45.0%			45.0%				55.0%			55.0%
Yellow Time (s)		4.5			4.5				3.5			3.5
All-Red Time (s)		0.5			0.5				0.5			0.5
Lost Time Adjust (s)		0.0			0.0				0.0			0.0
Total Lost Time (s)		5.0			5.0				4.0			4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max				None			None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 81 (81%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1339	0	0	1410	0	0	0	712	0	0	831
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	0	0	1900	0	0	0	1900	0	0	1900
Adj Flow Rate, veh/h	0	1380	0	0	1454	0	0	0	734	0	0	857
Adj No. of Lanes	0	2	0	0	3	0	0	0	2	0	0	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	3430	0	0	4928	0	0	0	0	0	0	0
Arrive On Green	0.00	0.64	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	3800	0	0	5529	0		0			0	
Grp Volume(v), veh/h	0	1380	0	0	1454	0		0.0			0.0	
Grp Sat Flow(s),veh/h/ln	0	1805	0	0	1729	0						
Q Serve(g_s), s	0.0	18.7	0.0	0.0	0.0	0.0						
Cycle Q Clear(g_c), s	0.0	18.7	0.0	0.0	0.0	0.0						
Prop In Lane	0.00		0.00	0.00		0.00						
Lane Grp Cap(c), veh/h	0	3430	0	0	4928	0						
V/C Ratio(X)	0.00	0.40	0.00	0.00	0.30	0.00						
Avail Cap(c_a), veh/h	0	3430	0	0	4928	0						
HCM Platoon Ratio	1.00	0.67	1.00	1.00	2.00	1.00						
Upstream Filter(I)	0.00	0.28	0.00	0.00	0.89	0.00						
Uniform Delay (d), s/veh	0.0	4.3	0.0	0.0	0.0	0.0						
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(-26165%),veh/ln	0.0	9.3	0.0	0.0	0.1	0.0						
LnGrp Delay(d),s/veh	0.0	4.4	0.0	0.0	0.1	0.0						
LnGrp LOS		A			A							
Approach Vol, veh/h		1380			1454							
Approach Delay, s/veh		4.4			0.1							
Approach LOS		A			A							

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		
Phs Duration (G+Y+Rc), s		100.0				100.0		
Change Period (Y+Rc), s		5.0				5.0		
Max Green Setting (Gmax), s		40.0				40.0		
Max Q Clear Time (g_c+I1), s		20.7				2.0		
Green Ext Time (p_c), s		18.5				35.1		

Intersection Summary	
HCM 2010 Ctrl Delay	2.2
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2006	45	34	1392	17	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	66.0	66.0	8.0	74.0	26.0	
Total Split (%)	66.0%	66.0%	8.0%	74.0%	26.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



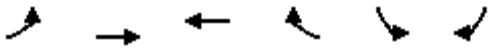
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2006	45	34	1392	17	21
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2180	49	37	1513	18	23
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	3025	1353	47	3227	23	29
Arrive On Green	1.00	1.00	0.05	1.00	0.03	0.03
Sat Flow, veh/h	3705	1615	1810	3705	728	931
Grp Volume(v), veh/h	2180	49	37	1513	42	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1699	0
Q Serve(g_s), s	0.0	0.0	2.0	0.0	2.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	2.0	0.0	2.5	0.0
Prop In Lane		1.00	1.00		0.43	0.55
Lane Grp Cap(c), veh/h	3025	1353	47	3227	53	0
V/C Ratio(X)	0.72	0.04	0.79	0.47	0.79	0.00
Avail Cap(c_a), veh/h	3025	1353	90	3227	391	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	47.2	0.0	48.1	0.0
Incr Delay (d2), s/veh	1.5	0.0	10.5	0.5	22.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.6	0.0	1.1	0.2	1.5	0.0
LnGrp Delay(d),s/veh	1.5	0.0	57.7	0.5	70.9	0.0
LnGrp LOS	A	A	E	A	E	
Approach Vol, veh/h	2229			1550	42	
Approach Delay, s/veh	1.5			1.9	70.9	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.6	88.3				93.9		6.1
Change Period (Y+Rc), s	3.0	4.5				4.5		3.0
Max Green Setting (Gmax), s	5.0	61.5				69.5		23.0
Max Q Clear Time (g_c+I1), s	4.0	2.0				2.0		4.5
Green Ext Time (p_c), s	0.0	57.4				64.8		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	2.4
HCM 2010 LOS	A

Notes

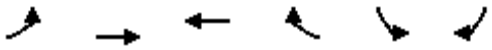
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	46	1962	1344	6	11	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	46	1962	1344	6	11	70
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	48	2065	1415	6	12	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.74				0.43	0.74
vC, conflicting volume	1421				2544	707
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	880				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				97	91
cM capacity (veh/h)	578				407	813

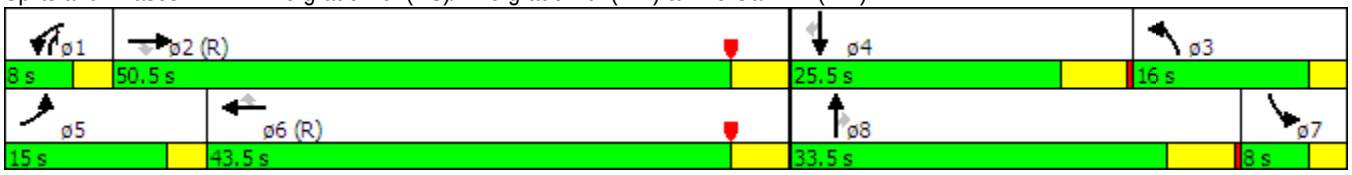
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	48	1033	1033	707	707	6	85
Volume Left	48	0	0	0	0	0	12
Volume Right	0	0	0	0	0	6	74
cSH	578	1700	1700	1700	1700	1700	716
Volume to Capacity	0.08	0.61	0.61	0.42	0.42	0.00	0.12
Queue Length 95th (ft)	7	0	0	0	0	0	10
Control Delay (s)	11.8	0.0	0.0	0.0	0.0	0.0	10.7
Lane LOS	B						B
Approach Delay (s)	0.3			0.0			10.7
Approach LOS							B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	192	1756	33	86	1085	6	109	67	371	27	22	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	15.0	50.5	50.5	8.0	43.5	43.5	16.0	33.5	8.0	8.0	25.5	25.5
Total Split (%)	15.0%	50.5%	50.5%	8.0%	43.5%	43.5%	16.0%	33.5%	8.0%	8.0%	25.5%	25.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	192	1756	33	86	1085	6	109	67	371	27	22	158
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	209	1909	0	93	1179	7	118	73	403	29	24	172
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	217	1938	867	90	1685	754	261	439	454	40	393	176
Arrive On Green	0.12	0.54	0.00	0.10	0.93	0.93	0.14	0.23	0.23	0.04	0.18	0.18
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	209	1909	0	93	1179	7	118	73	403	29	24	172
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	11.5	52.0	0.0	5.0	6.2	0.0	6.0	3.1	19.3	1.6	0.6	8.2
Cycle Q Clear(g_c), s	11.5	52.0	0.0	5.0	6.2	0.0	6.0	3.1	19.3	1.6	0.6	8.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	217	1938	867	90	1685	754	261	439	454	40	393	176
V/C Ratio(X)	0.96	0.99	0.00	1.03	0.70	0.01	0.45	0.17	0.89	0.73	0.06	0.98
Avail Cap(c_a), veh/h	217	1938	867	90	1685	754	261	532	533	90	722	323
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	0.00	0.87	0.87	0.87	1.00	1.00	1.00	0.99	0.99	0.99
Uniform Delay (d), s/veh	43.8	22.8	0.0	45.0	2.0	1.2	39.2	30.7	22.7	47.9	36.7	24.2
Incr Delay (d2), s/veh	50.0	17.2	0.0	96.2	2.1	0.0	0.5	0.3	16.4	8.9	0.1	38.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	8.8	30.3	0.0	4.9	2.8	0.0	3.0	1.6	10.7	0.9	0.3	5.4
LnGrp Delay(d),s/veh	93.8	40.0	0.0	141.6	4.1	1.2	39.6	31.0	39.1	56.7	36.8	62.6
LnGrp LOS	F	D		F	A	A	D	C	D	E	D	E
Approach Vol, veh/h		2118			1279			594			225	
Approach Delay, s/veh		45.3			14.1			38.2			59.1	
Approach LOS		D			B			D			E	

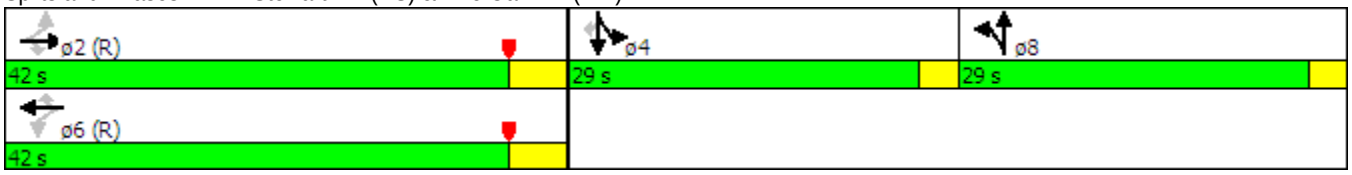
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	58.2	17.4	16.4	15.0	51.2	5.2	28.6
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	5.0	46.0	13.0	20.0	12.0	39.0	5.0	28.0
Max Q Clear Time (g_c+I1), s	7.0	54.0	8.0	10.2	13.5	8.2	3.6	21.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.8	0.0	29.1	0.0	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	35.6
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	2013	282	42	1062	7	79	23	14	23	105	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 19 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	59	2013	282	42	1062	7	79	23	14	23	105	13
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	64	2188	307	46	1154	8	86	25	15	25	114	14
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	426	2605	1165	169	2605	1165	111	32	19	150	157	134
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.08	0.08	0.08
Sat Flow, veh/h	491	3610	1615	134	3610	1615	1229	357	214	1810	1900	1615
Grp Volume(v), veh/h	64	2188	307	46	1154	8	126	0	0	25	114	14
Grp Sat Flow(s),veh/h/ln	491	1805	1615	134	1805	1615	1801	0	0	1810	1900	1615
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	6.8	0.0	0.0	1.3	5.9	0.8
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	6.8	0.0	0.0	1.3	5.9	0.8
Prop In Lane	1.00		1.00	1.00		1.00	0.68		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	426	2605	1165	169	2605	1165	163	0	0	150	157	134
V/C Ratio(X)	0.15	0.84	0.26	0.27	0.44	0.01	0.77	0.00	0.00	0.17	0.72	0.10
Avail Cap(c_a), veh/h	426	2605	1165	169	2605	1165	468	0	0	470	494	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.21	0.21	0.21	0.75	0.75	0.75	1.00	0.00	0.00	0.40	0.40	0.40
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	44.5	0.0	0.0	42.6	44.7	42.4
Incr Delay (d2), s/veh	0.2	0.8	0.1	3.0	0.4	0.0	7.5	0.0	0.0	0.2	2.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.3	0.0	0.1	0.1	0.0	3.7	0.0	0.0	0.7	3.2	0.4
LnGrp Delay(d),s/veh	0.2	0.8	0.1	3.0	0.4	0.0	52.0	0.0	0.0	42.9	47.3	42.6
LnGrp LOS	A	A	A	A	A	A	D			D	D	D
Approach Vol, veh/h		2559			1208			126			153	
Approach Delay, s/veh		0.7			0.5			52.0			46.1	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		76.7		11.3		76.7		12.1
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		2.0		7.9		2.0		8.8
Green Ext Time (p_c), s		29.4		0.6		29.4		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	3.9
HCM 2010 LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1381	536	270	1121	23	99	5	89	23	7	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		50	200		0	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	60			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1141			511			1039			220	
Travel Time (s)		17.3			7.7			23.6			5.0	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Detector Phase	5	2	2	1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	10.0	10.0		4.0	4.0	
Minimum Split (s)	8.0	20.5	20.5	8.0	20.0	20.0	20.5	20.5		8.0	20.0	
Total Split (s)	9.0	42.5	42.5	17.0	50.5	50.5	20.5	31.5		9.0	20.0	
Total Split (%)	9.0%	42.5%	42.5%	17.0%	50.5%	50.5%	20.5%	31.5%		9.0%	20.0%	
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5		3.5	3.5	
All-Red Time (s)	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	1381	536	270	1121	23	99	5	89	23	7	36
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	25	1501	583	293	1218	25	108	5	97	25	8	39
Adj No. of Lanes	1	2	1	1	2	1	2	1	0	1	1	0
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	36	1480	662	235	1877	840	562	22	418	36	35	172
Arrive On Green	0.04	0.82	0.82	0.26	1.00	1.00	0.16	0.27	0.27	0.02	0.13	0.13
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	3510	80	1547	1810	282	1375
Grp Volume(v), veh/h	25	1501	583	293	1218	25	108	0	102	25	0	47
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1755	0	1627	1810	0	1657
Q Serve(g_s), s	1.4	41.0	23.4	13.0	0.0	0.0	2.7	0.0	4.9	1.4	0.0	2.6
Cycle Q Clear(g_c), s	1.4	41.0	23.4	13.0	0.0	0.0	2.7	0.0	4.9	1.4	0.0	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.83
Lane Grp Cap(c), veh/h	36	1480	662	235	1877	840	562	0	439	36	0	207
V/C Ratio(X)	0.69	1.01	0.88	1.25	0.65	0.03	0.19	0.00	0.23	0.69	0.00	0.23
Avail Cap(c_a), veh/h	90	1480	662	235	1877	840	562	0	439	90	0	265
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.30	0.30	0.30	0.76	0.76	0.76	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.7	9.0	7.4	37.0	0.0	0.0	36.4	0.0	28.4	48.7	0.0	39.4
Incr Delay (d2), s/veh	6.8	16.5	5.5	134.8	1.3	0.1	0.8	0.0	1.2	20.8	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	21.9	10.4	15.2	0.3	0.0	1.3	0.0	2.3	0.9	0.0	1.2
LnGrp Delay(d),s/veh	54.5	25.5	12.9	171.8	1.3	0.1	37.2	0.0	29.7	69.5	0.0	39.9
LnGrp LOS	D	F	B	F	A	A	D		C	E		D
Approach Vol, veh/h		2109			1536			210			72	
Approach Delay, s/veh		22.4			33.8			33.5			50.2	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	45.5	20.5	17.0	6.0	56.5	6.0	31.5
Change Period (Y+Rc), s	4.0	4.5	4.5	* 4.5	4.0	4.5	4.0	4.5
Max Green Setting (Gmax), s	13.0	38.0	16.0	* 16	5.0	46.0	5.0	27.0
Max Q Clear Time (g_c+I1), s	15.0	43.0	4.7	4.6	3.4	2.0	3.4	6.9
Green Ext Time (p_c), s	0.0	0.0	0.4	0.8	0.0	41.9	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	27.9
HCM 2010 LOS	C

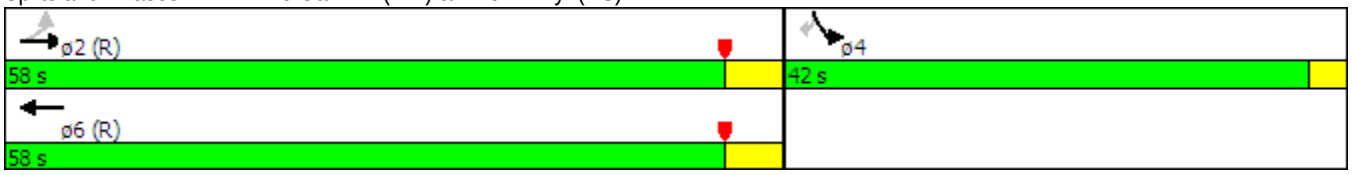
Notes

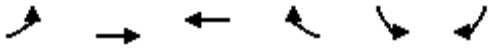
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	59	1434	1259	0	1114	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	20.0	20.0	28.5		27.0	27.0
Total Split (s)	58.0	58.0	58.0		42.0	42.0
Total Split (%)	58.0%	58.0%	58.0%		42.0%	42.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 21 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	59	1434	1259	0	1114	156
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	61	1478	1298	0	1148	161
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	211	2043	2043	0	1260	580
Arrive On Green	1.00	1.00	0.57	0.00	0.36	0.36
Sat Flow, veh/h	431	3705	3800	0	3510	1615
Grp Volume(v), veh/h	61	1478	1298	0	1148	161
Grp Sat Flow(s),veh/h/ln	431	1805	1805	0	1755	1615
Q Serve(g_s), s	8.1	0.0	24.4	0.0	31.1	7.1
Cycle Q Clear(g_c), s	32.5	0.0	24.4	0.0	31.1	7.1
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	211	2043	2043	0	1260	580
V/C Ratio(X)	0.29	0.72	0.64	0.00	0.91	0.28
Avail Cap(c_a), veh/h	211	2043	2043	0	1369	630
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	7.0	0.0	14.7	0.0	30.5	22.8
Incr Delay (d2), s/veh	0.3	0.2	1.5	0.0	8.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.0	0.1	12.5	0.0	16.6	3.2
LnGrp Delay(d),s/veh	7.3	0.2	16.2	0.0	39.5	23.1
LnGrp LOS	A	A	B		D	C
Approach Vol, veh/h		1539	1298		1309	
Approach Delay, s/veh		0.5	16.2		37.4	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		61.1		38.9		61.1		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		53.5		39.0		53.5		
Max Q Clear Time (g_c+I1), s		34.5		33.1		26.4		
Green Ext Time (p_c), s		18.3		2.7		25.8		

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2024	513	64	1957	269	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	80.0	80.0	80.0	80.0	20.0	20.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2024	513	64	1957	269	101
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2200	558	70	2127	292	110
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2708	1211	109	3890	562	258
Arrive On Green	0.75	0.75	0.75	0.75	0.16	0.16
Sat Flow, veh/h	3705	1615	103	5358	3510	1615
Grp Volume(v), veh/h	2200	558	70	2127	292	110
Grp Sat Flow(s),veh/h/ln	1805	1615	103	1729	1755	1615
Q Serve(g_s), s	39.0	13.2	36.0	17.4	7.6	6.1
Cycle Q Clear(g_c), s	39.0	13.2	75.0	17.4	7.6	6.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2708	1211	109	3890	562	258
V/C Ratio(X)	0.81	0.46	0.64	0.55	0.52	0.43
Avail Cap(c_a), veh/h	2708	1211	109	3890	562	258
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.0	4.8	40.5	5.3	38.5	37.9
Incr Delay (d2), s/veh	2.8	1.3	25.5	0.6	3.4	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	20.0	6.2	2.7	8.3	4.0	3.1
LnGrp Delay(d),s/veh	10.8	6.0	66.0	5.9	41.9	42.9
LnGrp LOS	B	A	E	A	D	D
Approach Vol, veh/h	2758			2197	402	
Approach Delay, s/veh	9.8			7.8	42.2	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		80.0				80.0		20.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		75.0				75.0		16.0
Max Q Clear Time (g_c+I1), s		41.0				77.0		9.6
Green Ext Time (p_c), s		33.9				0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.4
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	235	13	15	1012	1257	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			100
Storage Lanes	1	1	1			0
Taper Length (ft)	25		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			45	45	
Link Distance (ft)	296			257	167	
Travel Time (s)	6.7			3.9	2.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	31.0	31.0	8.0	69.0	61.0	61.0
Total Split (%)	31.0%	31.0%	8.0%	69.0%	61.0%	61.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 16: Arrow Hwy. (NS) & Driveway 1 (EW)





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	235	13	15	1012	1257	219
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	247	14	16	1065	1323	231
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	287	256	26	2748	2552	1142
Arrive On Green	0.16	0.16	0.01	0.76	1.00	1.00
Sat Flow, veh/h	1810	1615	1810	3705	3705	1615
Grp Volume(v), veh/h	247	14	16	1065	1323	231
Grp Sat Flow(s),veh/h/ln	1810	1615	1810	1805	1805	1615
Q Serve(g_s), s	13.3	0.7	0.9	10.0	0.0	0.0
Cycle Q Clear(g_c), s	13.3	0.7	0.9	10.0	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	287	256	26	2748	2552	1142
V/C Ratio(X)	0.86	0.05	0.62	0.39	0.52	0.20
Avail Cap(c_a), veh/h	489	436	72	2748	2552	1142
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	35.7	49.0	4.0	0.0	0.0
Incr Delay (d2), s/veh	7.7	0.1	21.4	0.4	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	7.3	0.7	0.6	5.0	0.3	0.1
LnGrp Delay(d),s/veh	48.7	35.8	70.4	4.5	0.8	0.4
LnGrp LOS	D	D	E	A	A	A
Approach Vol, veh/h	261			1081	1554	
Approach Delay, s/veh	48.0			5.4	0.7	
Approach LOS	D			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		80.1		19.9	5.4	74.7		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		65.0		27.0	4.0	57.0		
Max Q Clear Time (g_c+I1), s		12.0		15.3	2.9	2.0		
Green Ext Time (p_c), s		31.4		0.6	0.0	32.0		

Intersection Summary	
HCM 2010 Ctrl Delay	6.7
HCM 2010 LOS	A



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	6	2	4	1243	1474	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Link Speed (mph)	30			45	45	
Link Distance (ft)	301			157	350	
Travel Time (s)	6.8			2.4	5.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	6	2	4	1243	1474	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	2	4	1308	1552	42

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2215	776	1552	0	-	0
Stage 1	1552	-	-	-	-	-
Stage 2	663	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	38	345	433	-	-	-
Stage 1	163	-	-	-	-	-
Stage 2	480	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	37	345	433	-	-	-
Mov Cap-2 Maneuver	123	-	-	-	-	-
Stage 1	163	-	-	-	-	-
Stage 2	464	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31	0.2	0
HCM LOS	D		

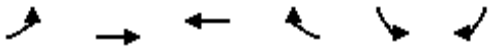
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	433	-	147	-	-
HCM Lane V/C Ratio	0.01	-	0.057	-	-
HCM Control Delay (s)	13.4	0.2	31	-	-
HCM Lane LOS	B	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

VOLUME-TO-CAPACITY RATIO



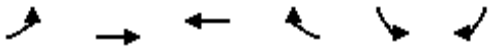
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	595	0	259	1717	945	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	647	0	282	1866	1027	274
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	647	0	282	1866	1027	274
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	44.1		11.7	59.8	32.2	100.0
Effective Green, g (s)	44.1		11.7	59.8	32.2	100.0
Actuated g/C Ratio	0.44		0.12	0.60	0.32	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1592		409	2158	1127	1615
v/s Ratio Prot	0.18		0.08	c0.52	c0.29	
v/s Ratio Perm						0.17
v/c Ratio	0.41		0.69	0.86	0.91	0.17
Uniform Delay, d1	19.0		42.4	16.7	32.5	0.0
Progression Factor	1.00		1.25	0.97	1.00	1.00
Incremental Delay, d2	0.8		0.4	0.5	10.1	0.2
Delay (s)	19.8		53.5	16.7	42.6	0.2
Level of Service	B		D	B	D	A
Approach Delay (s)	19.8			21.5	33.7	
Approach LOS	B			C	C	

Intersection Summary			
Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



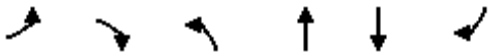
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	294	540	1896	661	193	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	320	587	2061	718	210	135
RTOR Reduction (vph)	0	0	0	262	0	120
Lane Group Flow (vph)	320	587	2061	456	210	15
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	27.7	78.2	47.5	47.5	11.3	11.3
Effective Green, g (s)	27.7	78.2	47.5	47.5	11.3	11.3
Actuated g/C Ratio	0.28	0.78	0.48	0.48	0.11	0.11
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	499	2823	1714	767	395	182
v/s Ratio Prot	c0.18	0.16	c0.57		c0.06	
v/s Ratio Perm				0.28		0.01
v/c Ratio	0.64	0.21	1.20	0.59	0.53	0.08
Uniform Delay, d1	31.8	2.8	26.2	19.2	41.9	39.7
Progression Factor	0.54	2.57	0.92	1.36	1.00	1.00
Incremental Delay, d2	2.0	0.2	94.4	1.9	1.4	0.2
Delay (s)	19.2	7.5	118.6	28.0	43.2	39.9
Level of Service	B	A	F	C	D	D
Approach Delay (s)		11.6	95.2		41.9	
Approach LOS		B	F		D	

Intersection Summary			
Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	723	1899	0	552	652
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	769	2020	0	587	694
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	769	2020	0	587	694
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		57.5	57.5		32.9	100.0
Effective Green, g (s)		57.5	57.5		32.9	100.0
Actuated g/C Ratio		0.58	0.58		0.33	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2982	2075		593	1615
v/s Ratio Prot		0.15	c0.56		c0.33	
v/s Ratio Perm						0.43
v/c Ratio		0.26	0.97		0.99	0.43
Uniform Delay, d1		10.6	20.5		33.4	0.0
Progression Factor		1.74	1.06		1.00	1.00
Incremental Delay, d2		0.2	10.4		34.0	0.8
Delay (s)		18.6	32.1		67.4	0.8
Level of Service		B	C		E	A
Approach Delay (s)		18.6	32.1		31.3	
Approach LOS		B	C		C	

Intersection Summary			
Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	239	112	131	2173	678	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.37	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	703	3610	3610	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	260	122	142	2362	737	332
RTOR Reduction (vph)	0	107	0	0	0	70
Lane Group Flow (vph)	260	15	142	2362	737	262
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	12.7	12.7	78.8	78.8	78.8	78.8
Effective Green, g (s)	12.7	12.7	78.8	78.8	78.8	78.8
Actuated g/C Ratio	0.13	0.13	0.79	0.79	0.79	0.79
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	444	205	553	2844	2844	1272
v/s Ratio Prot	c0.07			c0.65	0.20	
v/s Ratio Perm		0.01	0.20			0.16
v/c Ratio	0.59	0.08	0.26	0.83	0.26	0.21
Uniform Delay, d1	41.2	38.5	2.8	6.5	2.8	2.7
Progression Factor	1.12	1.33	0.62	0.47	1.81	6.97
Incremental Delay, d2	2.0	0.2	0.7	1.8	0.2	0.3
Delay (s)	48.1	51.2	2.4	4.9	5.3	19.0
Level of Service	D	D	A	A	A	B
Approach Delay (s)	49.1			4.7	9.6	
Approach LOS	D			A	A	

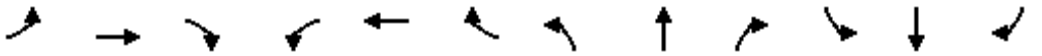
Intersection Summary			
Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	213	10	97	374	12	10	9	93	8	6	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3586		1805	3594		1805	1640			1747	
Flt Permitted	0.29	1.00		0.52	1.00		0.74	1.00			0.95	
Satd. Flow (perm)	546	3586		984	3594		1399	1640			1685	
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)	26	239	11	109	420	13	11	10	104	9	7	16
RTOR Reduction (vph)	0	6	0	0	3	0	0	28	0	0	4	0
Lane Group Flow (vph)	26	244	0	109	430	0	11	86	0	0	28	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)	18.4	18.4		18.4	18.4		73.1	73.1			73.1	
Effective Green, g (s)	18.4	18.4		18.4	18.4		73.1	73.1			73.1	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.73	0.73			0.73	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	100	659		181	661		1022	1198			1231	
v/s Ratio Prot		0.07			c0.12			c0.05				
v/s Ratio Perm	0.05			0.11			0.01				0.02	
v/c Ratio	0.26	0.37		0.60	0.65		0.01	0.07			0.02	
Uniform Delay, d1	35.0	35.7		37.4	37.8		3.6	3.8			3.7	
Progression Factor	0.64	0.67		0.87	0.86		0.38	0.28			1.00	
Incremental Delay, d2	1.2	0.3		5.5	2.3		0.0	0.1			0.0	
Delay (s)	23.8	24.3		38.0	34.8		1.4	1.2			3.7	
Level of Service	C	C		D	C		A	A			A	
Approach Delay (s)		24.2			35.4			1.2			3.7	
Approach LOS		C			D			A			A	

Intersection Summary			
Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	32.8%	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	674	813	1553	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	356	717	865	1652	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	356	717	865	1652	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	19.5	100.0	69.4	100.0		
Effective Green, g (s)	19.5	100.0	69.4	100.0		
Actuated g/C Ratio	0.20	1.00	0.69	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	703	1615	1252	3610		
v/s Ratio Prot	0.10		c0.48	c0.46		
v/s Ratio Perm		0.44				
v/c Ratio	0.51	0.44	0.69	0.46		
Uniform Delay, d1	36.0	0.0	9.0	0.0		
Progression Factor	0.74	1.00	0.65	1.00		
Incremental Delay, d2	2.6	0.9	3.0	0.4		
Delay (s)	29.1	0.9	8.8	0.4		
Level of Service	C	A	A	A		
Approach Delay (s)	10.2			3.3	0.0	
Approach LOS	B			A	A	

Intersection Summary			
Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

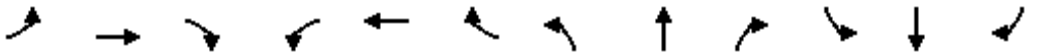


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	335	0	0	1621	0	0	0	796	0	0	745
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0				4.0			4.0
Lane Util. Factor		0.95			0.91				0.88			1.00
Frt		1.00			1.00				0.85			0.86
Flt Protected		1.00			1.00				1.00			1.00
Satd. Flow (prot)		3610			5187				2842			1644
Flt Permitted		1.00			1.00				1.00			1.00
Satd. Flow (perm)		3610			5187				2842			1644
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	345	0	0	1671	0	0	0	821	0	0	768
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	295	0	0	11
Lane Group Flow (vph)	0	345	0	0	1671	0	0	0	526	0	0	757
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Actuated Green, G (s)		40.9			40.9				50.1			50.1
Effective Green, g (s)		40.9			40.9				50.1			50.1
Actuated g/C Ratio		0.41			0.41				0.50			0.50
Clearance Time (s)		5.0			5.0				4.0			4.0
Vehicle Extension (s)		4.5			4.5				3.0			3.0
Lane Grp Cap (vph)		1476			2121				1423			823
v/s Ratio Prot		0.10			c0.32				0.18			c0.46
v/s Ratio Perm												
v/c Ratio		0.23			0.79				0.37			0.92
Uniform Delay, d1		19.3			25.8				15.3			23.1
Progression Factor		0.33			1.01				1.00			1.00
Incremental Delay, d2		0.3			2.5				0.2			15.1
Delay (s)		6.6			28.6				15.4			38.2
Level of Service		A			C				B			D
Approach Delay (s)		6.6			28.6			15.4			38.2	
Approach LOS		A			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

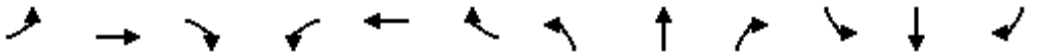
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1026	105	47	1470	151	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	3610	1615	1805	3610	1766	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	3610	1615	1805	3610	1766	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1115	114	51	1598	164	62
RTOR Reduction (vph)	0	16	0	0	15	0
Lane Group Flow (vph)	1115	98	51	1598	211	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	67.4	67.4	5.0	75.4	17.1	
Effective Green, g (s)	67.4	67.4	5.0	75.4	17.1	
Actuated g/C Ratio	0.67	0.67	0.05	0.75	0.17	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2433	1088	90	2721	301	
v/s Ratio Prot	0.31		0.03	c0.44	c0.12	
v/s Ratio Perm		0.06				
v/c Ratio	0.46	0.09	0.57	0.59	0.70	
Uniform Delay, d1	7.7	5.7	46.4	5.4	39.0	
Progression Factor	0.93	1.03	0.77	2.49	1.00	
Incremental Delay, d2	0.6	0.2	4.0	0.8	7.2	
Delay (s)	7.8	6.0	39.7	14.3	46.2	
Level of Service	A	A	D	B	D	
Approach Delay (s)	7.6			15.1	46.2	
Approach LOS	A			B	D	

Intersection Summary			
Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	184	734	90	258	1217	13	51	52	111	30	77	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
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	798	98	280	1323	14	55	57	121	33	84	190
RTOR Reduction (vph)	0	0	49	0	0	7	0	0	68	0	0	171
Lane Group Flow (vph)	200	798	49	280	1323	7	55	57	53	33	84	19
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	17.1	50.0	50.0	18.8	51.7	51.7	5.2	9.9	28.7	5.3	10.0	10.0
Effective Green, g (s)	17.1	50.0	50.0	18.8	51.7	51.7	5.2	9.9	28.7	5.3	10.0	10.0
Actuated g/C Ratio	0.17	0.50	0.50	0.19	0.52	0.52	0.05	0.10	0.29	0.05	0.10	0.10
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	308	1805	807	339	1866	834	93	188	463	95	361	161
v/s Ratio Prot	0.11	0.22		c0.16	c0.37		c0.03	c0.03	0.02	0.02	0.02	
v/s Ratio Perm			0.03			0.00			0.01			0.01
v/c Ratio	0.65	0.44	0.06	0.83	0.71	0.01	0.59	0.30	0.11	0.35	0.23	0.12
Uniform Delay, d1	38.7	16.0	12.9	39.0	18.4	11.7	46.4	41.8	26.3	45.7	41.5	41.0
Progression Factor	0.85	0.73	2.10	1.21	0.59	1.00	1.00	1.00	1.00	0.36	0.28	0.43
Incremental Delay, d2	3.2	0.7	0.1	8.5	1.3	0.0	6.5	1.6	0.0	0.8	0.6	0.6
Delay (s)	36.0	12.4	27.2	56.0	12.1	11.7	52.9	43.4	26.3	17.1	12.2	18.2
Level of Service	D	B	C	E	B	B	D	D	C	B	B	B
Approach Delay (s)		18.1			19.7			36.8			16.4	
Approach LOS		B			B			D			B	

Intersection Summary				
Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

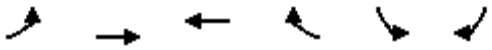


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	679	31	19	1561	39	224	123	38	13	30	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1822		1805	1900	1615
Flt Permitted	0.07	1.00	1.00	0.32	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	139	3610	1615	603	3610	1615		1822		1805	1900	1615
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)	21	738	34	21	1697	42	243	134	41	14	33	85
RTOR Reduction (vph)	0	0	15	0	0	15	0	4	0	0	0	80
Lane Group Flow (vph)	21	738	19	21	1697	27	0	414	0	14	33	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	54.8	54.8	54.8	54.8	54.8	54.8		28.4		6.3	6.3	6.3
Effective Green, g (s)	54.8	54.8	54.8	54.8	54.8	54.8		28.4		6.3	6.3	6.3
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.55	0.55		0.28		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	76	1978	885	330	1978	885		517		113	119	101
v/s Ratio Prot		0.20			c0.47			c0.23		0.01	c0.02	
v/s Ratio Perm	0.15		0.01	0.03		0.02						0.00
v/c Ratio	0.28	0.37	0.02	0.06	0.86	0.03		0.80		0.12	0.28	0.05
Uniform Delay, d1	12.0	12.8	10.3	10.6	19.3	10.4		33.2		44.2	44.7	44.0
Progression Factor	1.88	1.93	3.42	1.75	1.58	2.42		1.00		1.86	1.83	4.30
Incremental Delay, d2	8.2	0.5	0.0	0.2	3.2	0.0		8.7		0.5	1.3	0.2
Delay (s)	30.9	25.3	35.3	18.8	33.6	25.2		41.9		82.6	83.0	189.4
Level of Service	C	C	D	B	C	C		D		F	F	F
Approach Delay (s)		25.9			33.2			41.9			151.5	
Approach LOS		C			C			D			F	

Intersection Summary				
Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	79.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	540	65	137	1415	43	305	10	299	12	4	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.87	
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)	1805	3610	1615	1805	3610	1615	3502	1624		1805	1661	
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)	1805	3610	1615	1805	3610	1615	3502	1624		1805	1661	
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)	47	587	71	149	1538	47	332	11	325	13	4	21
RTOR Reduction (vph)	0	0	46	0	0	26	0	213	0	0	19	0
Lane Group Flow (vph)	47	587	25	149	1538	21	332	123	0	13	6	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	3.2	34.8	34.8	13.0	44.6	44.6	28.0	34.4		0.8	7.2	
Effective Green, g (s)	3.2	34.8	34.8	13.0	44.6	44.6	28.0	34.4		0.8	7.2	
Actuated g/C Ratio	0.03	0.35	0.35	0.13	0.45	0.45	0.28	0.34		0.01	0.07	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	4.5		3.0	3.0	
Lane Grp Cap (vph)	57	1256	562	234	1610	720	980	558		14	119	
v/s Ratio Prot	0.03	0.16		c0.08	c0.43		c0.09	c0.08		0.01	0.00	
v/s Ratio Perm			0.02			0.01						
v/c Ratio	0.82	0.47	0.04	0.64	0.96	0.03	0.34	0.22		0.93	0.05	
Uniform Delay, d1	48.1	25.4	21.6	41.3	26.7	15.5	28.6	23.3		49.6	43.2	
Progression Factor	1.47	0.69	1.00	1.20	0.62	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	57.5	1.2	0.1	4.8	12.6	0.1	0.9	0.9		201.0	0.2	
Delay (s)	128.1	18.8	21.7	54.4	29.3	15.6	29.6	24.2		250.5	43.4	
Level of Service	F	B	C	D	C	B	C	C		F	D	
Approach Delay (s)		26.4			31.1			26.9			114.2	
Approach LOS		C			C			C			F	

Intersection Summary				
Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	72.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

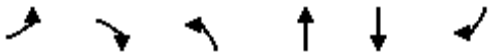


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	111	739	1496	0	469	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.13	1.00	1.00		0.95	1.00
Satd. Flow (perm)	240	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	114	762	1542	0	484	101
RTOR Reduction (vph)	0	0	0	0	0	34
Lane Group Flow (vph)	114	762	1542	0	484	67
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	73.2	73.2	73.2		19.3	19.3
Effective Green, g (s)	73.2	73.2	73.2		19.3	19.3
Actuated g/C Ratio	0.73	0.73	0.73		0.19	0.19
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	175	2642	2642		675	311
v/s Ratio Prot		0.21	0.43		c0.14	
v/s Ratio Perm	c0.47					0.04
v/c Ratio	0.65	0.29	0.58		0.72	0.22
Uniform Delay, d1	6.9	4.6	6.3		37.8	34.0
Progression Factor	1.33	0.45	0.85		0.72	0.54
Incremental Delay, d2	16.1	0.3	0.4		3.6	0.3
Delay (s)	25.2	2.3	5.7		30.7	18.8
Level of Service	C	A	A		C	B
Approach Delay (s)		5.3	5.7		28.6	
Approach LOS		A	A		C	

Intersection Summary			
Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	903	118	35	2806	638	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.25	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	481	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	982	128	38	3050	693	115
RTOR Reduction (vph)	0	27	0	0	0	35
Lane Group Flow (vph)	982	101	38	3050	693	81
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	66.0	66.0	66.0	66.0	25.0	25.0
Effective Green, g (s)	66.0	66.0	66.0	66.0	25.0	25.0
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.25	0.25
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2382	1065	317	3423	875	403
v/s Ratio Prot	0.27			c0.59	c0.20	
v/s Ratio Perm		0.06	0.08			0.05
v/c Ratio	0.41	0.09	0.12	0.89	0.79	0.20
Uniform Delay, d1	7.9	6.2	6.3	14.0	35.1	29.6
Progression Factor	1.39	2.35	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.8	4.0	7.3	1.1
Delay (s)	11.5	14.7	7.0	18.0	42.3	30.7
Level of Service	B	B	A	B	D	C
Approach Delay (s)	11.9			17.9	40.7	
Approach LOS	B			B	D	

Intersection Summary			
Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



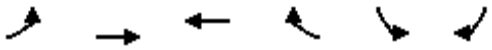
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	255	12	10	2048	555	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1805	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1805	1615	1805	3610	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	268	13	11	2156	584	179
RTOR Reduction (vph)	0	11	0	0	0	55
Lane Group Flow (vph)	268	2	11	2156	584	124
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	17.7	17.7	0.8	74.3	69.5	69.5
Effective Green, g (s)	17.7	17.7	0.8	74.3	69.5	69.5
Actuated g/C Ratio	0.18	0.18	0.01	0.74	0.70	0.70
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)	319	285	14	2682	2508	1122
v/s Ratio Prot	c0.15		0.01	c0.60	0.16	
v/s Ratio Perm		0.00				0.08
v/c Ratio	0.84	0.01	0.79	0.80	0.23	0.11
Uniform Delay, d1	39.8	33.9	49.5	8.2	5.5	5.0
Progression Factor	1.00	1.00	1.01	0.76	1.03	1.63
Incremental Delay, d2	17.7	0.0	80.9	1.3	0.2	0.2
Delay (s)	57.5	33.9	130.9	7.5	5.9	8.4
Level of Service	E	C	F	A	A	A
Approach Delay (s)	56.4			8.2	6.5	
Approach LOS	E			A	A	

Intersection Summary			
Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



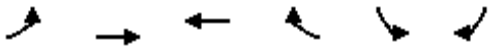
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	953	0	378	968	884	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1036	0	411	1052	961	320
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1036	0	411	1052	961	320
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	41.1		14.9	60.0	32.0	100.0
Effective Green, g (s)	41.1		14.9	60.0	32.0	100.0
Actuated g/C Ratio	0.41		0.15	0.60	0.32	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1483		521	2166	1120	1615
v/s Ratio Prot	c0.29		c0.12	0.29	c0.27	
v/s Ratio Perm						0.20
v/c Ratio	0.70		0.79	0.49	0.86	0.20
Uniform Delay, d1	24.3		41.0	11.3	31.9	0.0
Progression Factor	1.00		1.37	0.79	1.13	1.00
Incremental Delay, d2	2.8		6.0	0.6	6.1	0.2
Delay (s)	27.1		62.1	9.6	42.3	0.2
Level of Service	C		E	A	D	A
Approach Delay (s)	27.1			24.3	31.8	
Approach LOS	C			C	C	

Intersection Summary			
Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



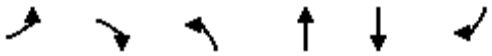
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	192	1041	1064	216	418	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	1132	1157	235	454	343
RTOR Reduction (vph)	0	0	0	112	0	279
Lane Group Flow (vph)	209	1132	1157	123	454	64
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	15.2	70.7	52.5	52.5	18.8	18.8
Effective Green, g (s)	15.2	70.7	52.5	52.5	18.8	18.8
Actuated g/C Ratio	0.15	0.71	0.52	0.52	0.19	0.19
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	274	2552	1895	847	658	303
v/s Ratio Prot	c0.12	0.31	c0.32		c0.13	
v/s Ratio Perm				0.08		0.04
v/c Ratio	0.76	0.44	0.61	0.15	0.69	0.21
Uniform Delay, d1	40.7	6.3	16.6	12.2	37.9	34.3
Progression Factor	0.46	2.48	0.81	1.06	1.00	1.00
Incremental Delay, d2	8.9	0.5	1.4	0.3	3.0	0.4
Delay (s)	27.5	16.0	14.9	13.3	40.9	34.7
Level of Service	C	B	B	B	D	C
Approach Delay (s)		17.8	14.6		38.2	
Approach LOS		B	B		D	

Intersection Summary			
Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	1449	828	0	439	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1575	900	0	477	476
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1575	900	0	477	476
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		57.8	57.8		32.6	100.0
Effective Green, g (s)		57.8	57.8		32.6	100.0
Actuated g/C Ratio		0.58	0.58		0.33	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2998	2086		588	1615
v/s Ratio Prot		c0.30	0.25		c0.26	
v/s Ratio Perm						0.29
v/c Ratio		0.53	0.43		0.81	0.29
Uniform Delay, d1		12.8	11.9		30.9	0.0
Progression Factor		1.26	1.08		1.00	1.00
Incremental Delay, d2		0.6	0.6		8.3	0.5
Delay (s)		16.7	13.4		39.2	0.5
Level of Service		B	B		D	A
Approach Delay (s)		16.7	13.4		19.9	
Approach LOS		B	B		B	

Intersection Summary			
Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	165	138	127	1121	1375	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.17	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	317	3610	3610	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	172	144	132	1168	1432	152
RTOR Reduction (vph)	0	76	0	0	0	29
Lane Group Flow (vph)	172	68	132	1168	1432	123
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	10.7	10.7	80.8	80.8	80.8	80.8
Effective Green, g (s)	10.7	10.7	80.8	80.8	80.8	80.8
Actuated g/C Ratio	0.11	0.11	0.81	0.81	0.81	0.81
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	374	172	256	2916	2916	1304
v/s Ratio Prot	c0.05			0.32	0.40	
v/s Ratio Perm		0.04	c0.42			0.08
v/c Ratio	0.46	0.40	0.52	0.40	0.49	0.09
Uniform Delay, d1	41.9	41.6	3.2	2.7	3.1	2.0
Progression Factor	1.27	1.50	0.73	0.68	3.25	7.11
Incremental Delay, d2	0.9	1.5	6.7	0.4	0.5	0.1
Delay (s)	54.0	64.1	9.0	2.2	10.5	14.3
Level of Service	D	E	A	A	B	B
Approach Delay (s)	58.6			2.9	10.8	
Approach LOS	E			A	B	

Intersection Summary			
Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

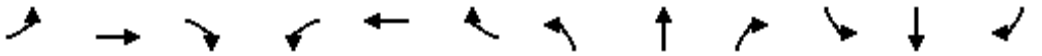
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	253	39	306	173	4	1	2	77	5	21	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3537		1805	3598		1805	1623			1796	
Flt Permitted	0.61	1.00		0.51	1.00		0.72	1.00			0.98	
Satd. Flow (perm)	1156	3537		971	3598		1374	1623			1768	
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)	3	329	51	397	225	5	1	3	100	6	27	19
RTOR Reduction (vph)	0	20	0	0	2	0	0	64	0	0	12	0
Lane Group Flow (vph)	3	360	0	397	228	0	1	40	0	0	40	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)	55.0	55.0		55.0	55.0		36.5	36.5			36.5	
Effective Green, g (s)	55.0	55.0		55.0	55.0		36.5	36.5			36.5	
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.36	0.36			0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	635	1945		534	1978		501	592			645	
v/s Ratio Prot		0.10			0.06			c0.02				
v/s Ratio Perm	0.00			c0.41			0.00				0.02	
v/c Ratio	0.00	0.19		0.74	0.12		0.00	0.07			0.06	
Uniform Delay, d1	10.2	11.3		17.1	10.8		20.2	20.7			20.6	
Progression Factor	1.02	1.45		0.89	0.92		1.01	0.75			1.00	
Incremental Delay, d2	0.0	0.0		5.5	0.0		0.0	0.2			0.2	
Delay (s)	10.4	16.4		20.8	9.9		20.4	15.8			20.8	
Level of Service	B	B		C	A		C	B			C	
Approach Delay (s)		16.3			16.8			15.8			20.8	
Approach LOS		B			B			B			C	

Intersection Summary				
Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5	
Intersection Capacity Utilization	43.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1339	1173	704	1536	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1440	1261	757	1652	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1440	1261	757	1652	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	43.5	100.0	45.4	100.0		
Effective Green, g (s)	43.5	100.0	45.4	100.0		
Actuated g/C Ratio	0.44	1.00	0.45	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	1570	1615	819	3610		
v/s Ratio Prot	c0.40		c0.42	0.46		
v/s Ratio Perm		0.78				
v/c Ratio	0.92	0.78	0.92	0.46		
Uniform Delay, d1	26.6	0.0	25.7	0.0		
Progression Factor	0.86	1.00	0.81	1.00		
Incremental Delay, d2	10.0	3.8	17.3	0.4		
Delay (s)	32.8	3.8	38.1	0.4		
Level of Service	C	A	D	A		
Approach Delay (s)	19.3			12.3	0.0	
Approach LOS	B			B	A	

Intersection Summary			
Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

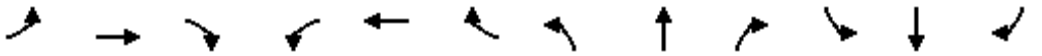


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1339	0	0	1410	0	0	0	712	0	0	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0				4.0			4.0
Lane Util. Factor		0.95			0.91				0.88			1.00
Frt		1.00			1.00				0.85			0.86
Flt Protected		1.00			1.00				1.00			1.00
Satd. Flow (prot)		3610			5187				2842			1644
Flt Permitted		1.00			1.00				1.00			1.00
Satd. Flow (perm)		3610			5187				2842			1644
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	1380	0	0	1454	0	0	0	734	0	0	857
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	11	0	0	11
Lane Group Flow (vph)	0	1380	0	0	1454	0	0	0	723	0	0	846
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Actuated Green, G (s)		40.0			40.0				51.0			51.0
Effective Green, g (s)		40.0			40.0				51.0			51.0
Actuated g/C Ratio		0.40			0.40				0.51			0.51
Clearance Time (s)		5.0			5.0				4.0			4.0
Vehicle Extension (s)		4.5			4.5				3.0			3.0
Lane Grp Cap (vph)		1444			2074				1449			838
v/s Ratio Prot		c0.38			0.28				0.25			c0.51
v/s Ratio Perm												
v/c Ratio		0.96			0.70				0.50			1.01
Uniform Delay, d1		29.1			25.0				16.1			24.5
Progression Factor		1.04			0.79				1.00			1.00
Incremental Delay, d2		7.5			1.8				0.3			33.5
Delay (s)		37.7			21.6				16.4			58.0
Level of Service		D			C				B			E
Approach Delay (s)		37.7			21.6			16.4			58.0	
Approach LOS		D			C			B			E	

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2006	45	34	1392	17	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.92	
Flt Protected	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)	3610	1615	1805	3610	1718	
Flt Permitted	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (perm)	3610	1615	1805	3610	1718	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2180	49	37	1513	18	23
RTOR Reduction (vph)	0	2	0	0	22	0
Lane Group Flow (vph)	2180	47	37	1513	19	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	81.3	81.3	3.5	87.8	4.7	
Effective Green, g (s)	81.3	81.3	3.5	87.8	4.7	
Actuated g/C Ratio	0.81	0.81	0.04	0.88	0.05	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2934	1312	63	3169	80	
v/s Ratio Prot	c0.60		c0.02	0.42	c0.01	
v/s Ratio Perm		0.03				
v/c Ratio	0.74	0.04	0.59	0.48	0.24	
Uniform Delay, d1	4.4	1.8	47.5	1.3	45.9	
Progression Factor	1.45	1.18	1.07	2.87	1.00	
Incremental Delay, d2	1.5	0.0	7.3	0.4	1.5	
Delay (s)	7.8	2.2	57.9	4.1	47.5	
Level of Service	A	A	E	A	D	
Approach Delay (s)	7.7			5.4	47.5	
Approach LOS	A			A	D	

Intersection Summary			
Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

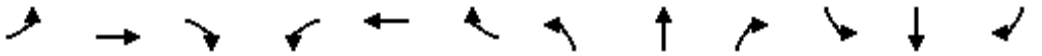


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	192	1756	33	86	1085	6	109	67	371	27	22	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
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)	209	1909	36	93	1179	7	118	73	403	29	24	172
RTOR Reduction (vph)	0	0	17	0	0	4	0	0	64	0	0	157
Lane Group Flow (vph)	209	1909	19	93	1179	3	118	73	339	29	24	15
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	17.4	54.1	54.1	11.7	48.4	48.4	9.2	10.8	22.5	7.4	9.0	9.0
Effective Green, g (s)	17.4	54.1	54.1	11.7	48.4	48.4	9.2	10.8	22.5	7.4	9.0	9.0
Actuated g/C Ratio	0.17	0.54	0.54	0.12	0.48	0.48	0.09	0.11	0.22	0.07	0.09	0.09
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	314	1953	873	211	1747	781	166	205	363	133	324	145
v/s Ratio Prot	c0.12	c0.53		0.05	0.33		c0.07	0.04	c0.11	0.02	0.01	
v/s Ratio Perm			0.01			0.00			0.10			0.01
v/c Ratio	0.67	0.98	0.02	0.44	0.67	0.00	0.71	0.36	0.94	0.22	0.07	0.11
Uniform Delay, d1	38.6	22.4	10.7	41.1	19.8	13.3	44.1	41.4	38.0	43.6	41.7	41.8
Progression Factor	1.10	0.65	1.00	1.21	0.79	1.00	1.00	1.00	1.00	0.99	0.90	0.88
Incremental Delay, d2	3.0	12.9	0.0	0.5	1.9	0.0	11.3	1.8	30.5	0.3	0.2	0.6
Delay (s)	45.6	27.4	10.7	50.4	17.5	13.3	55.4	43.2	68.6	43.5	37.7	37.5
Level of Service	D	C	B	D	B	B	E	D	E	D	D	D
Approach Delay (s)		28.9			19.9			62.8			38.3	
Approach LOS		C			B			E			D	

Intersection Summary				
Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	85.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

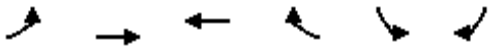
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	2013	282	42	1062	7	79	23	14	23	105	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1808		1805	1900	1615
Flt Permitted	0.20	1.00	1.00	0.06	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	378	3610	1615	115	3610	1615		1808		1805	1900	1615
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)	64	2188	307	46	1154	8	86	25	15	25	114	14
RTOR Reduction (vph)	0	0	57	0	0	3	0	6	0	0	0	12
Lane Group Flow (vph)	64	2188	250	46	1154	5	0	120	0	25	114	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	66.3	66.3	66.3	66.3	66.3	66.3		11.9		11.3	11.3	11.3
Effective Green, g (s)	66.3	66.3	66.3	66.3	66.3	66.3		11.9		11.3	11.3	11.3
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66	0.66		0.12		0.11	0.11	0.11
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	250	2393	1070	76	2393	1070		215		203	214	182
v/s Ratio Prot		c0.61			0.32			c0.07		0.01	c0.06	
v/s Ratio Perm	0.17		0.15	0.40		0.00						0.00
v/c Ratio	0.26	0.91	0.23	0.61	0.48	0.00		0.56		0.12	0.53	0.01
Uniform Delay, d1	6.8	14.4	6.7	9.5	8.3	5.7		41.6		39.9	41.9	39.4
Progression Factor	1.57	1.28	2.16	1.26	0.85	1.00		1.00		0.90	0.86	1.00
Incremental Delay, d2	1.2	3.5	0.2	25.5	0.6	0.0		3.1		0.2	2.2	0.0
Delay (s)	11.9	21.9	14.8	37.4	7.6	5.7		44.7		36.0	38.1	39.4
Level of Service	B	C	B	D	A	A		D		D	D	D
Approach Delay (s)		20.8			8.8			44.7			37.9	
Approach LOS		C			A			D			D	

Intersection Summary				
Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	75.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1381	536	270	1121	23	99	5	89	23	7	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.88	
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)	1805	3610	1615	1805	3610	1615	3502	1629		1805	1664	
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)	1805	3610	1615	1805	3610	1615	3502	1629		1805	1664	
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)	25	1501	583	293	1218	25	108	5	97	25	8	39
RTOR Reduction (vph)	0	0	126	0	0	13	0	66	0	0	35	0
Lane Group Flow (vph)	25	1501	457	293	1218	12	108	36	0	25	12	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	2.0	35.6	35.6	13.0	46.6	46.6	24.0	32.4		2.0	10.4	
Effective Green, g (s)	2.0	35.6	35.6	13.0	46.6	46.6	24.0	32.4		2.0	10.4	
Actuated g/C Ratio	0.02	0.36	0.36	0.13	0.47	0.47	0.24	0.32		0.02	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	4.5		3.0	3.0	
Lane Grp Cap (vph)	36	1285	574	234	1682	752	840	527		36	173	
v/s Ratio Prot	0.01	c0.42		c0.16	0.34		c0.03	c0.02		c0.01	0.01	
v/s Ratio Perm			0.28			0.01						
v/c Ratio	0.69	1.17	0.80	1.25	0.72	0.02	0.13	0.07		0.69	0.07	
Uniform Delay, d1	48.7	32.2	28.9	43.5	21.5	14.4	29.8	23.4		48.7	40.4	
Progression Factor	1.31	0.75	0.59	1.37	0.33	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.4	79.5	4.8	139.1	2.3	0.0	0.3	0.3		44.9	0.2	
Delay (s)	85.3	103.7	21.9	198.8	9.3	14.4	30.1	23.6		93.6	40.6	
Level of Service	F	F	C	F	A	B	C	C		F	D	
Approach Delay (s)		80.8			45.5			27.0			59.0	
Approach LOS		F			D			C			E	

Intersection Summary				
Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	73.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

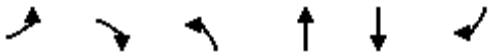


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	59	1434	1259	0	1114	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.13	1.00	1.00		0.95	1.00
Satd. Flow (perm)	238	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	61	1478	1298	0	1148	161
RTOR Reduction (vph)	0	0	0	0	0	26
Lane Group Flow (vph)	61	1478	1298	0	1148	135
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	55.4	55.4	55.4		37.1	37.1
Effective Green, g (s)	55.4	55.4	55.4		37.1	37.1
Actuated g/C Ratio	0.55	0.55	0.55		0.37	0.37
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	131	1999	1999		1299	599
v/s Ratio Prot		c0.41	0.36		c0.33	
v/s Ratio Perm	0.26					0.08
v/c Ratio	0.47	0.74	0.65		0.88	0.22
Uniform Delay, d1	13.4	16.8	15.5		29.4	21.6
Progression Factor	0.79	0.70	1.15		0.94	1.29
Incremental Delay, d2	1.1	0.2	1.4		6.6	0.2
Delay (s)	11.7	12.1	19.3		34.4	28.1
Level of Service	B	B	B		C	C
Approach Delay (s)		12.1	19.3		33.6	
Approach LOS		B	B		C	

Intersection Summary			
Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2024	513	64	1957	269	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.05	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	101	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2200	558	70	2127	292	110
RTOR Reduction (vph)	0	52	0	0	0	17
Lane Group Flow (vph)	2200	506	70	2127	292	93
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	75.0	75.0	75.0	75.0	16.0	16.0
Effective Green, g (s)	75.0	75.0	75.0	75.0	16.0	16.0
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.16	0.16
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2707	1211	75	3890	560	258
v/s Ratio Prot	0.61			0.41	c0.08	
v/s Ratio Perm		0.31	c0.69			0.06
v/c Ratio	0.81	0.42	0.93	0.55	0.52	0.36
Uniform Delay, d1	8.0	4.6	10.4	5.3	38.5	37.4
Progression Factor	1.58	1.56	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.7	86.5	0.6	3.4	3.9
Delay (s)	14.5	7.8	96.9	5.9	41.9	41.3
Level of Service	B	A	F	A	D	D
Approach Delay (s)	13.1			8.8	41.8	
Approach LOS	B			A	D	

Intersection Summary			
Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	235	13	15	1012	1257	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1805	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1805	1615	1805	3610	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	14	16	1065	1323	231
RTOR Reduction (vph)	0	11	0	0	0	77
Lane Group Flow (vph)	247	3	16	1065	1323	154
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	18.9	18.9	2.5	73.1	66.6	66.6
Effective Green, g (s)	18.9	18.9	2.5	73.1	66.6	66.6
Actuated g/C Ratio	0.19	0.19	0.02	0.73	0.67	0.67
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)	341	305	45	2638	2404	1075
v/s Ratio Prot	c0.14		0.01	c0.30	c0.37	
v/s Ratio Perm		0.00				0.10
v/c Ratio	0.72	0.01	0.36	0.40	0.55	0.14
Uniform Delay, d1	38.1	32.9	48.0	5.1	8.8	6.2
Progression Factor	1.00	1.00	1.11	0.83	0.77	0.48
Incremental Delay, d2	7.4	0.0	4.1	0.4	0.8	0.2
Delay (s)	45.5	33.0	57.2	4.6	7.6	3.2
Level of Service	D	C	E	A	A	A
Approach Delay (s)	44.9			5.4	6.9	
Approach LOS	D			A	A	

Intersection Summary			
Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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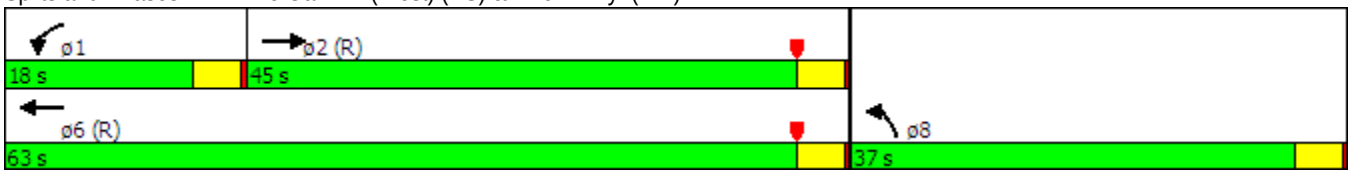
APPENDIX M:

LONG RANGE (2035) WITHOUT PROJECT CONDITIONS INTERSECTION ANALYSIS WORKSHEETS

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	634	0	270	1848	1022	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	45.0		18.0	63.0	37.0	
Total Split (%)	45.0%		18.0%	63.0%	37.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	634	0	270	1848	1022	269
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	689	0	293	2009	1111	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1617	0	359	2130	1158	533
Arrive On Green	0.45	0.00	0.20	1.00	0.33	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	689	0	293	2009	1111	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	13.0	0.0	8.0	0.0	31.0	0.0
Cycle Q Clear(g_c), s	13.0	0.0	8.0	0.0	31.0	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1617	0	359	2130	1158	533
V/C Ratio(X)	0.43	0.00	0.82	0.94	0.96	0.00
Avail Cap(c_a), veh/h	1617	0	491	2130	1158	533
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.8	0.0	38.9	0.0	32.8	0.0
Incr Delay (d2), s/veh	0.8	0.0	6.0	10.1	17.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	6.7	0.0	4.1	3.0	17.8	0.0
LnGrp Delay(d),s/veh	19.7	0.0	44.9	10.1	50.3	0.0
LnGrp LOS	B		D	B	D	
Approach Vol, veh/h	689			2302	1111	
Approach Delay, s/veh	19.7			14.5	50.3	
Approach LOS	B			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.2	48.8				63.0		37.0
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	14.0	41.0				59.0		33.0
Max Q Clear Time (g_c+I1), s	10.0	15.0				2.0		33.0
Green Ext Time (p_c), s	0.2	25.1				53.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	25.1
HCM 2010 LOS	C

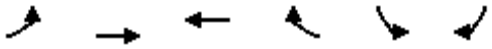
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	319	570	2027	715	203	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	17.0	69.5	52.5	52.5	30.5	30.5
Total Split (%)	17.0%	69.5%	52.5%	52.5%	30.5%	30.5%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	319	570	2027	715	203	135
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	347	620	2203	777	221	147
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	253	2802	2189	979	417	192
Arrive On Green	0.28	1.00	1.00	1.00	0.12	0.12
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	347	620	2203	777	221	147
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	14.0	0.0	60.6	0.0	5.9	8.8
Cycle Q Clear(g_c), s	14.0	0.0	60.6	0.0	5.9	8.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	253	2802	2189	979	417	192
V/C Ratio(X)	1.37	0.22	1.01	0.79	0.53	0.77
Avail Cap(c_a), veh/h	253	2802	2189	979	913	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.47	0.47	1.00	1.00
Uniform Delay (d), s/veh	36.0	0.0	0.0	0.0	41.4	42.7
Incr Delay (d2), s/veh	189.5	0.2	14.7	3.2	1.0	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	20.2	0.1	4.5	0.9	2.9	8.0
LnGrp Delay(d),s/veh	225.5	0.2	14.7	3.2	42.5	49.0
LnGrp LOS	F	A	F	A	D	D
Approach Vol, veh/h		967	2980		368	
Approach Delay, s/veh		81.0	11.7		45.1	
Approach LOS		F	B		D	

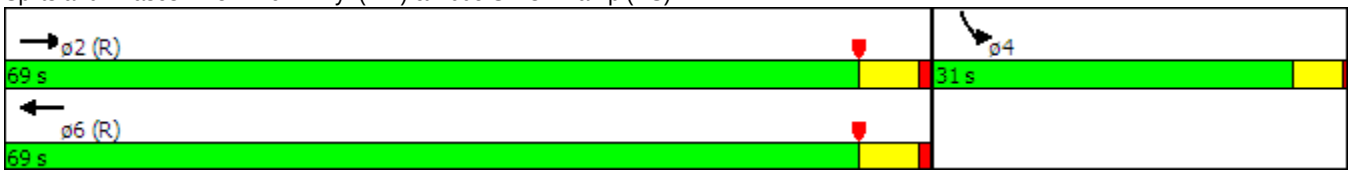
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		83.6		16.4	17.0	66.6		
Change Period (Y+Rc), s		6.0		4.5	3.0	6.0		
Max Green Setting (Gmax), s		63.5		26.0	14.0	46.5		
Max Q Clear Time (g_c+I1), s		2.0		10.8	16.0	62.6		
Green Ext Time (p_c), s		60.5		1.0	0.0	0.0		

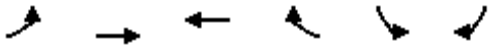
Intersection Summary	
HCM 2010 Ctrl Delay	30.1
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	763	2041	0	427	697
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		69.0	69.0		31.0	
Total Split (%)		69.0%	69.0%		31.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

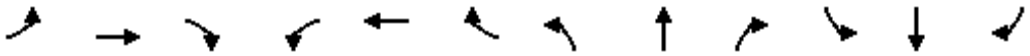




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	763	2041	0	427	697
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	812	2171	0	454	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	3307	2302	0	482	430
Arrive On Green	0.00	1.00	0.64	0.00	0.27	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	812	2171	0	454	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	54.7	0.0	24.6	0.0
Cycle Q Clear(g_c), s	0.0	0.0	54.7	0.0	24.6	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	3307	2302	0	482	430
V/C Ratio(X)	0.00	0.25	0.94	0.00	0.94	0.00
Avail Cap(c_a), veh/h	0	3307	2302	0	487	434
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.96	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	16.5	0.0	35.9	0.0
Incr Delay (d2), s/veh	0.0	0.2	9.5	0.0	26.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.1	29.9	0.0	15.8	0.0
LnGrp Delay(d),s/veh	0.0	0.2	25.9	0.0	62.7	0.0
LnGrp LOS		A	C		E	
Approach Vol, veh/h		812	2171		454	
Approach Delay, s/veh		0.2	25.9		62.7	
Approach LOS		A	C		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		69.3		30.7		69.3		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		63.5		26.9		63.5		
Max Q Clear Time (g_c+I1), s		2.0		26.6		56.7		
Green Ext Time (p_c), s		61.3		0.1		6.8		

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	783	32	0	2041	346	0	0	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	783	32	0	2041	346	0	0	33	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	816	33	0	2126	360	0	0	34	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	2126	0	0	816	0	0	1879	2942	408
Stage 1	-	-	-	-	-	-	816	816	-
Stage 2	-	-	-	-	-	-	1063	2126	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	260	-	-	820	-	0	64	15	598
Stage 1	-	-	-	-	-	0	400	393	-
Stage 2	-	-	-	-	-	0	298	91	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	260	-	-	820	-	-	64	0	598
Mov Cap-2 Maneuver	-	-	-	-	-	-	64	0	-
Stage 1	-	-	-	-	-	-	400	0	-
Stage 2	-	-	-	-	-	-	298	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.4
HCM LOS			B

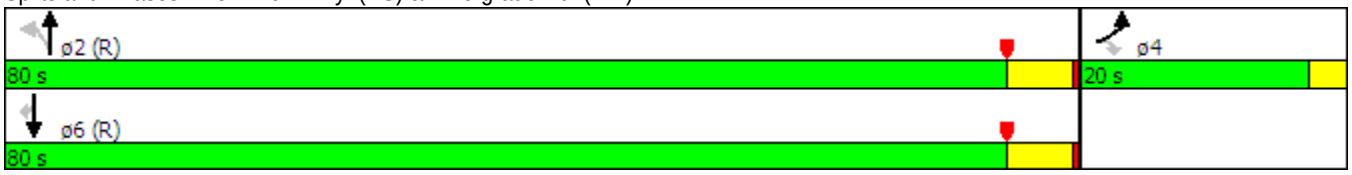
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	598	260	-	-	820	-
HCM Lane V/C Ratio	0.057	-	-	-	-	-
HCM Control Delay (s)	11.4	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	255	13	23	2178	546	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			931	1292	
Travel Time (s)	15.2			14.1	19.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	20.0	20.0	80.0	80.0	80.0	80.0
Total Split (%)	20.0%	20.0%	80.0%	80.0%	80.0%	80.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	255	13	23	2178	546	331
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	277	14	25	2367	593	360
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	360	166	536	2933	2933	1312
Arrive On Green	0.10	0.10	0.81	0.81	0.81	0.81
Sat Flow, veh/h	3510	1615	598	3705	3705	1615
Grp Volume(v), veh/h	277	14	25	2367	593	360
Grp Sat Flow(s),veh/h/ln	1755	1615	598	1805	1805	1615
Q Serve(g_s), s	7.7	0.8	1.0	35.7	3.7	5.4
Cycle Q Clear(g_c), s	7.7	0.8	4.7	35.7	3.7	5.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	360	166	536	2933	2933	1312
V/C Ratio(X)	0.77	0.08	0.05	0.81	0.20	0.27
Avail Cap(c_a), veh/h	597	275	536	2933	2933	1312
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	40.6	2.6	5.1	2.1	2.3
Incr Delay (d2), s/veh	3.4	0.2	0.2	2.5	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.9	0.4	0.2	18.1	1.9	2.5
LnGrp Delay(d),s/veh	47.1	40.8	2.8	7.6	2.3	2.8
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	291			2392	953	
Approach Delay, s/veh	46.8			7.6	2.5	
Approach LOS	D			A	A	

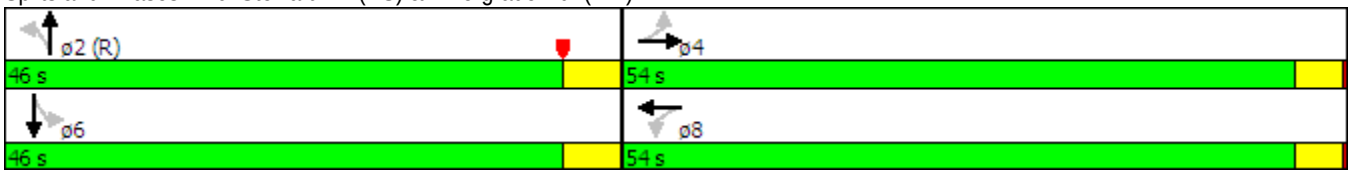
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		86.7		13.3		86.7		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		74.5		17.0		74.5		
Max Q Clear Time (g_c+I1), s		37.7		9.7		7.4		
Green Ext Time (p_c), s		29.8		0.6		46.8		

Intersection Summary	
HCM 2010 Ctrl Delay	9.4
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	126	11	103	289	12	11	10	95	8	7	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	54.0	54.0		54.0	54.0		46.0	46.0		46.0	46.0	
Total Split (%)	54.0%	54.0%		54.0%	54.0%		46.0%	46.0%		46.0%	46.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	126	11	103	289	12	11	10	95	8	7	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	28	142	12	116	325	13	12	11	107	9	8	17
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	172	599	50	249	629	25	1112	113	1095	328	300	583
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1059	3373	282	1252	3539	141	1408	153	1485	384	407	790
Grp Volume(v), veh/h	28	75	79	116	165	173	12	0	118	34	0	0
Grp Sat Flow(s),veh/h/ln	1059	1805	1850	1252	1805	1875	1408	0	1638	1581	0	0
Q Serve(g_s), s	2.5	3.6	3.7	8.8	8.3	8.3	0.0	0.0	2.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	10.8	3.6	3.7	12.4	8.3	8.3	0.2	0.0	2.0	0.5	0.0	0.0
Prop In Lane	1.00		0.15	1.00		0.08	1.00		0.91	0.26		0.50
Lane Grp Cap(c), veh/h	172	321	329	249	321	333	1112	0	1208	1211	0	0
V/C Ratio(X)	0.16	0.23	0.24	0.47	0.52	0.52	0.01	0.00	0.10	0.03	0.00	0.00
Avail Cap(c_a), veh/h	513	903	925	653	903	938	1112	0	1208	1211	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	0.98	0.98	0.98	0.64	0.00	0.64	1.00	0.00	0.00
Uniform Delay (d), s/veh	42.1	35.3	35.3	40.7	37.2	37.2	3.5	0.0	3.7	3.5	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.3	0.3	1.3	1.3	1.2	0.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	1.8	1.9	3.1	4.2	4.4	0.1	0.0	1.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	42.5	35.6	35.7	42.0	38.5	38.5	3.5	0.0	3.8	3.6	0.0	0.0
LnGrp LOS	D	D	D	D	D	D	A		A	A		
Approach Vol, veh/h		182			454			130			34	
Approach Delay, s/veh		36.7			39.4			3.8			3.6	
Approach LOS		D			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		78.2		21.8		78.2		21.8
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		41.5		50.0		41.5		50.0
Max Q Clear Time (g_c+I1), s		4.0		12.8		2.5		14.4
Green Ext Time (p_c), s		0.6		3.4		0.6		3.3

Intersection Summary	
HCM 2010 Ctrl Delay	31.5
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	357	727	758	1667	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	27.0		73.0	100.0		
Total Split (%)	27.0%		73.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



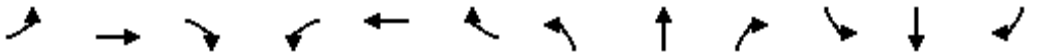
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	357	727	758	1667	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	380	0	806	1773		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.94	0.94	0.94	0.94		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	895	401	1220	3531		
Arrive On Green	0.25	0.00	1.00	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	380	0	806	1773		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	8.8	0.0	0.0	0.0		
Cycle Q Clear(g_c), s	8.8	0.0	0.0	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	895	401	1220	3531		
V/C Ratio(X)	0.42	0.00	0.66	0.50		
Avail Cap(c_a), veh/h	895	401	1220	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	31.6	0.0	0.0	0.0		
Incr Delay (d2), s/veh	1.5	0.0	2.8	0.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	4.6	0.0	1.0	0.3		
LnGrp Delay(d),s/veh	33.1	0.0	2.8	0.5		
LnGrp LOS	C		A	A		
Approach Vol, veh/h	380			2579		
Approach Delay, s/veh	33.1			1.2		
Approach LOS	C			A		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	73.0	30.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	67.4	* 22				94.4		
Max Q Clear Time (g_c+I1), s	2.0	10.8				2.0		
Green Ext Time (p_c), s	9.5	10.1				66.4		

Intersection Summary	
HCM 2010 Ctrl Delay	5.3
HCM 2010 LOS	A

Notes

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	357	0	0	1629	0	0	0	731	0	0	796
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	180.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	357	0	0	1629	0	0	0	731	0	0	796
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	368	0	0	1679	0	0	0	754	0	0	821

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1679	0	0	368	0	0	1208	2047	184	1863	2047	840
Stage 1	-	-	-	-	-	-	368	368	-	1679	1679	-
Stage 2	-	-	-	-	-	-	840	1679	-	184	368	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	387	-	-	1202	-	-	141	57	833	46	57	~ 313
Stage 1	-	-	-	-	-	-	630	625	-	101	153	-
Stage 2	-	-	-	-	-	-	330	153	-	806	625	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	387	-	-	1202	-	-	-	57	833	4	57	~ 313
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	57	-	4	57	-
Stage 1	-	-	-	-	-	-	630	625	-	101	153	-
Stage 2	-	-	-	-	-	-	-	153	-	77	625	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	35	$ 764.4
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	833	387	-	-	1202	-	-	313
HCM Lane V/C Ratio	0.905	-	-	-	-	-	-	2.622
HCM Control Delay (s)	35	0	-	-	0	-	-	$ 764.4
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	12.6	0	-	-	0	-	-	68

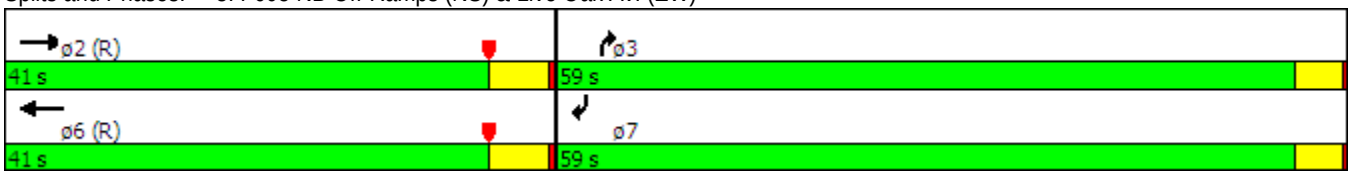
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	357	0	0	1629	0	0	0	731	0	0	796
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Detector Phase		2			6				3			7
Switch Phase												
Minimum Initial (s)		10.0			10.0				4.0			4.0
Minimum Split (s)		21.0			21.0				8.0			8.0
Total Split (s)		41.0			41.0				59.0			59.0
Total Split (%)		41.0%			41.0%				59.0%			59.0%
Yellow Time (s)		4.5			4.5				3.5			3.5
All-Red Time (s)		0.5			0.5				0.5			0.5
Lost Time Adjust (s)		0.0			0.0				0.0			0.0
Total Lost Time (s)		5.0			5.0				4.0			4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max				None			None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	357	0	0	1629	0	0	0	731	0	0	796
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	0	0	1900	0	0	0	1900	0	0	1900
Adj Flow Rate, veh/h	0	368	0	0	1679	0	0	0	754	0	0	821
Adj No. of Lanes	0	2	0	0	3	0	0	0	2	0	0	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	3430	0	0	4928	0	0	0	0	0	0	0
Arrive On Green	0.00	0.31	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	3800	0	0	5529	0		0			0	
Grp Volume(v), veh/h	0	368	0	0	1679	0		0.0			0.0	
Grp Sat Flow(s),veh/h/ln	0	1805	0	0	1729	0						
Q Serve(g_s), s	0.0	7.2	0.0	0.0	2.4	0.0						
Cycle Q Clear(g_c), s	0.0	7.2	0.0	0.0	2.4	0.0						
Prop In Lane	0.00		0.00	0.00		0.00						
Lane Grp Cap(c), veh/h	0	3430	0	0	4928	0						
V/C Ratio(X)	0.00	0.11	0.00	0.00	0.34	0.00						
Avail Cap(c_a), veh/h	0	3430	0	0	4928	0						
HCM Platoon Ratio	1.00	0.33	1.00	1.00	1.00	1.00						
Upstream Filter(I)	0.00	0.87	0.00	0.00	0.76	0.00						
Uniform Delay (d), s/veh	0.0	4.2	0.0	0.0	0.2	0.0						
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(-26165%),veh/ln	0.0	3.7	0.0	0.0	1.0	0.0						
LnGrp Delay(d),s/veh	0.0	4.3	0.0	0.0	0.3	0.0						
LnGrp LOS		A			A							
Approach Vol, veh/h		368			1679							
Approach Delay, s/veh		4.3			0.3							
Approach LOS		A			A							

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		
Phs Duration (G+Y+Rc), s		100.0				100.0		
Change Period (Y+Rc), s		5.0				5.0		
Max Green Setting (Gmax), s		36.0				36.0		
Max Q Clear Time (g_c+I1), s		9.2				4.4		
Green Ext Time (p_c), s		21.9				25.1		

Intersection Summary	
HCM 2010 Ctrl Delay	1.0
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	974	114	51	1465	164	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	59.0	59.0	12.0	71.0	29.0	
Total Split (%)	59.0%	59.0%	12.0%	71.0%	29.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



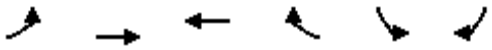
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	974	114	51	1465	164	62
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	1059	124	55	1592	178	67
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2504	1120	71	2755	205	77
Arrive On Green	0.46	0.46	0.03	0.51	0.16	0.16
Sat Flow, veh/h	3705	1615	1810	3705	1268	477
Grp Volume(v), veh/h	1059	124	55	1592	246	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1752	0
Q Serve(g_s), s	19.5	4.3	3.0	30.6	13.7	0.0
Cycle Q Clear(g_c), s	19.5	4.3	3.0	30.6	13.7	0.0
Prop In Lane		1.00	1.00		0.72	0.27
Lane Grp Cap(c), veh/h	2504	1120	71	2755	284	0
V/C Ratio(X)	0.42	0.11	0.77	0.58	0.87	0.00
Avail Cap(c_a), veh/h	2504	1120	163	2755	456	0
HCM Platoon Ratio	0.67	0.67	0.67	0.67	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.4	9.4	48.2	13.3	40.9	0.0
Incr Delay (d2), s/veh	0.5	0.2	6.5	0.9	9.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	10.0	2.0	1.6	15.5	7.4	0.0
LnGrp Delay(d),s/veh	14.0	9.6	54.7	14.2	50.7	0.0
LnGrp LOS	B	A	D	B	D	
Approach Vol, veh/h	1183			1647	246	
Approach Delay, s/veh	13.5			15.5	50.7	
Approach LOS	B			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.9	73.9				80.8		19.2
Change Period (Y+Rc), s	3.0	4.5				4.5		3.0
Max Green Setting (Gmax), s	9.0	54.5				66.5		26.0
Max Q Clear Time (g_c+I1), s	5.0	21.5				32.6		15.7
Green Ext Time (p_c), s	0.0	29.6				30.4		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	17.6
HCM 2010 LOS	B

Notes

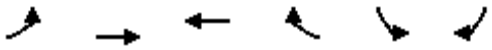
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	92	949	1394	59	14	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	92	949	1394	59	14	142
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	97	999	1467	62	15	149
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.72				0.80	0.72
vC, conflicting volume	1529				2161	734
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	958				1009	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	81				91	81
cM capacity (veh/h)	523				158	786

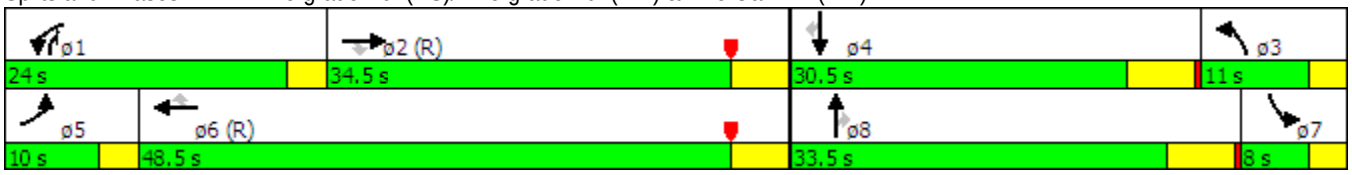
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	97	499	499	734	734	62	164
Volume Left	97	0	0	0	0	0	15
Volume Right	0	0	0	0	0	62	149
cSH	523	1700	1700	1700	1700	1700	579
Volume to Capacity	0.19	0.29	0.29	0.43	0.43	0.04	0.28
Queue Length 95th (ft)	17	0	0	0	0	0	29
Control Delay (s)	13.4	0.0	0.0	0.0	0.0	0.0	13.7
Lane LOS	B						B
Approach Delay (s)	1.2			0.0			13.7
Approach LOS							B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	759	97	278	1305	14	54	54	115	32	82	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	10.0	34.5	34.5	24.0	48.5	48.5	11.0	33.5	24.0	8.0	30.5	30.5
Total Split (%)	10.0%	34.5%	34.5%	24.0%	48.5%	48.5%	11.0%	33.5%	24.0%	8.0%	30.5%	30.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	98	759	97	278	1305	14	54	54	115	32	82	77
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	107	825	0	302	1418	15	59	59	125	35	89	84
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	127	1966	879	326	2364	1058	76	152	421	63	263	118
Arrive On Green	0.02	0.18	0.00	0.36	1.00	1.00	0.04	0.08	0.08	0.03	0.07	0.07
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	107	825	0	302	1418	15	59	59	125	35	89	84
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	5.9	20.3	0.0	16.0	0.0	0.0	3.2	2.9	4.9	1.9	2.3	4.2
Cycle Q Clear(g_c), s	5.9	20.3	0.0	16.0	0.0	0.0	3.2	2.9	4.9	1.9	2.3	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	1966	879	326	2364	1058	76	152	421	63	263	118
V/C Ratio(X)	0.84	0.42	0.00	0.93	0.60	0.01	0.77	0.39	0.30	0.56	0.34	0.71
Avail Cap(c_a), veh/h	127	1966	879	380	2364	1058	145	532	744	90	903	404
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.26	0.26	0.26	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	48.3	27.0	0.0	31.3	0.0	0.0	47.4	43.7	19.1	47.5	44.1	31.4
Incr Delay (d2), s/veh	36.3	0.7	0.0	8.8	0.3	0.0	6.1	2.7	0.7	2.3	1.0	10.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	4.2	10.3	0.0	8.7	0.1	0.0	1.7	1.7	2.3	1.0	1.2	2.2
LnGrp Delay(d),s/veh	84.6	27.7	0.0	40.1	0.3	0.0	53.5	46.4	19.7	49.8	45.1	42.0
LnGrp LOS	F	C		D	A	A	D	D	B	D	D	D
Approach Vol, veh/h		932			1735			243			208	
Approach Delay, s/veh		34.2			7.2			34.4			44.6	
Approach LOS		C			A			C			D	

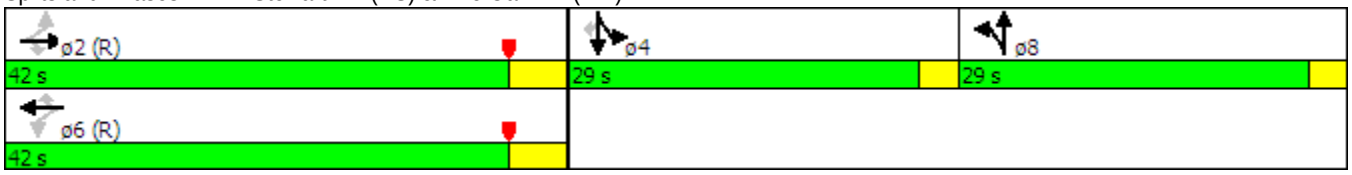
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	59.0	7.2	12.8	10.0	70.0	6.5	13.5
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	21.0	30.0	8.0	25.0	7.0	44.0	5.0	28.0
Max Q Clear Time (g_c+I1), s	18.0	22.3	5.2	6.2	7.9	2.0	3.9	6.9
Green Ext Time (p_c), s	0.0	7.1	0.0	1.1	0.0	31.4	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	19.9
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	695	33	19	1676	39	242	132	35	14	30	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	695	33	19	1676	39	242	132	35	14	30	84
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	23	755	36	21	1822	42	263	143	38	15	33	91
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	211	2015	902	461	2015	902	279	152	40	140	147	125
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.26	0.26	0.26	0.08	0.08	0.08
Sat Flow, veh/h	250	3610	1615	696	3610	1615	1077	586	156	1810	1900	1615
Grp Volume(v), veh/h	23	755	36	21	1822	42	444	0	0	15	33	91
Grp Sat Flow(s),veh/h/ln	250	1805	1615	696	1805	1615	1819	0	0	1810	1900	1615
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	23.9	0.0	0.0	0.8	1.6	5.5
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	23.9	0.0	0.0	0.8	1.6	5.5
Prop In Lane	1.00		1.00	1.00		1.00	0.59		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	211	2015	902	461	2015	902	472	0	0	140	147	125
V/C Ratio(X)	0.11	0.37	0.04	0.05	0.90	0.05	0.94	0.00	0.00	0.11	0.22	0.73
Avail Cap(c_a), veh/h	211	2015	902	461	2015	902	473	0	0	470	494	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.72	0.72	0.72	1.00	0.00	0.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	36.3	0.0	0.0	42.9	43.3	45.1
Incr Delay (d2), s/veh	0.9	0.5	0.1	0.1	5.4	0.1	27.2	0.0	0.0	0.3	0.7	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.1	0.1	0.0	0.0	1.5	0.0	15.5	0.0	0.0	0.4	0.9	2.7
LnGrp Delay(d),s/veh	0.9	0.5	0.1	0.1	5.4	0.1	63.5	0.0	0.0	43.2	44.0	52.1
LnGrp LOS	A	A	A	A	A	A	E			D	D	D
Approach Vol, veh/h		814			1885			444			139	
Approach Delay, s/veh		0.5			5.2			63.5			49.2	
Approach LOS		A			A			E			D	

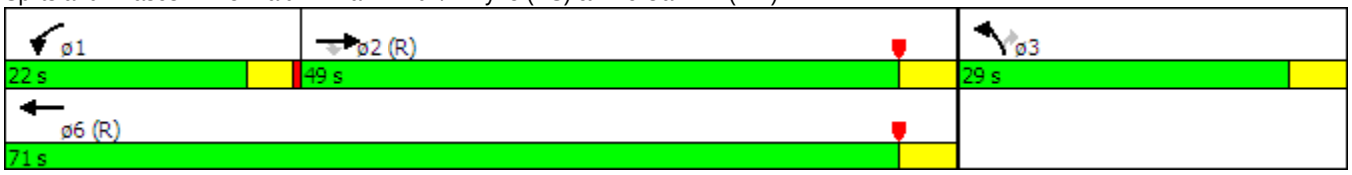
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		60.3		10.7		60.3		28.9
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		2.0		7.5		2.0		25.9
Green Ext Time (p_c), s		19.4		0.4		19.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	585	71	145	1533	330	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	200		100	0
Storage Lanes		1	1		1	1
Taper Length (ft)			60		60	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	1141			511	1039	
Travel Time (s)	17.3			7.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Detector Phase	2	2	1	6	3	3
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	10.0	10.0
Minimum Split (s)	20.5	20.5	8.0	20.0	20.5	20.5
Total Split (s)	49.0	49.0	22.0	71.0	29.0	29.0
Total Split (%)	49.0%	49.0%	22.0%	71.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5	4.5
All-Red Time (s)	0.0	0.0	0.5	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.0	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	585	71	145	1533	330	321
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	636	77	158	1666	359	349
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1879	841	189	2401	860	396
Arrive On Green	1.00	1.00	0.21	1.00	0.25	0.25
Sat Flow, veh/h	3705	1615	1810	3705	3510	1615
Grp Volume(v), veh/h	636	77	158	1666	359	349
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1755	1615
Q Serve(g_s), s	0.0	0.0	8.4	0.0	8.6	20.8
Cycle Q Clear(g_c), s	0.0	0.0	8.4	0.0	8.6	20.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1879	841	189	2401	860	396
V/C Ratio(X)	0.34	0.09	0.84	0.69	0.42	0.88
Avail Cap(c_a), veh/h	1879	841	326	2401	860	396
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.76	0.76	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	38.7	0.0	31.7	36.4
Incr Delay (d2), s/veh	0.5	0.2	7.2	1.3	1.5	23.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.1	0.0	4.5	0.4	4.3	11.8
LnGrp Delay(d),s/veh	0.5	0.2	45.9	1.3	33.2	59.9
LnGrp LOS	A	A	D	A	C	E
Approach Vol, veh/h	713			1824	708	
Approach Delay, s/veh	0.4			5.1	46.4	
Approach LOS	A			A	D	

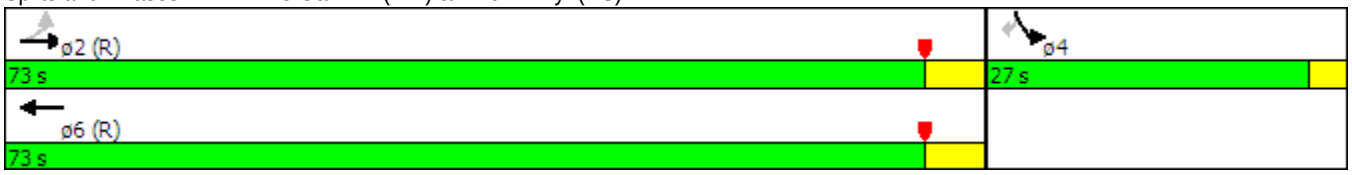
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.5	56.5				71.0		29.0
Change Period (Y+Rc), s	4.0	4.5				4.5		4.5
Max Green Setting (Gmax), s	18.0	44.5				66.5		24.5
Max Q Clear Time (g_c+I1), s	10.4	2.0				2.0		22.8
Green Ext Time (p_c), s	0.2	36.0				50.7		0.8

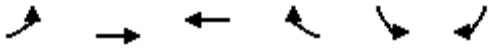
Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	109	796	1606	0	488	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	20.0	20.0	28.5		27.0	27.0
Total Split (s)	73.0	73.0	73.0		27.0	27.0
Total Split (%)	73.0%	73.0%	73.0%		27.0%	27.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 33 (33%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	109	796	1606	0	488	72
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	112	821	1656	0	503	74
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	238	2718	2718	0	604	278
Arrive On Green	0.50	0.50	0.75	0.00	0.17	0.17
Sat Flow, veh/h	306	3705	3800	0	3510	1615
Grp Volume(v), veh/h	112	821	1656	0	503	74
Grp Sat Flow(s),veh/h/ln	306	1805	1805	0	1755	1615
Q Serve(g_s), s	30.9	13.3	20.9	0.0	13.8	4.0
Cycle Q Clear(g_c), s	51.8	13.3	20.9	0.0	13.8	4.0
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	238	2718	2718	0	604	278
V/C Ratio(X)	0.47	0.30	0.61	0.00	0.83	0.27
Avail Cap(c_a), veh/h	238	2718	2718	0	843	388
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	27.8	9.4	5.6	0.0	40.0	35.9
Incr Delay (d2), s/veh	6.0	0.3	1.0	0.0	5.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.0	6.7	10.5	0.0	7.1	1.8
LnGrp Delay(d),s/veh	33.8	9.7	6.7	0.0	45.1	36.4
LnGrp LOS	C	A	A		D	D
Approach Vol, veh/h		933	1656		577	
Approach Delay, s/veh		12.6	6.7		44.0	
Approach LOS		B	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		79.8		20.2		79.8		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		68.5		24.0		68.5		
Max Q Clear Time (g_c+I1), s		53.8		15.8		22.9		
Green Ext Time (p_c), s		14.1		1.4		41.2		

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	956	123	38	3014	684	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	72.0	72.0	72.0	72.0	28.0	28.0
Total Split (%)	72.0%	72.0%	72.0%	72.0%	28.0%	28.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	956	123	38	3014	684	115
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	1039	134	41	3276	743	125
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2419	1082	333	3475	843	388
Arrive On Green	0.67	0.67	0.67	0.67	0.24	0.24
Sat Flow, veh/h	3705	1615	486	5358	3510	1615
Grp Volume(v), veh/h	1039	134	41	3276	743	125
Grp Sat Flow(s),veh/h/ln	1805	1615	486	1729	1755	1615
Q Serve(g_s), s	13.3	3.0	4.3	56.6	20.4	6.4
Cycle Q Clear(g_c), s	13.3	3.0	17.6	56.6	20.4	6.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2419	1082	333	3475	843	388
V/C Ratio(X)	0.43	0.12	0.12	0.94	0.88	0.32
Avail Cap(c_a), veh/h	2419	1082	333	3475	843	388
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.6	5.9	11.7	14.8	36.6	31.3
Incr Delay (d2), s/veh	0.6	0.2	0.8	6.7	12.8	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	6.7	1.4	0.6	28.6	11.4	3.1
LnGrp Delay(d),s/veh	8.2	6.2	12.5	21.5	49.5	33.5
LnGrp LOS	A	A	B	C	D	C
Approach Vol, veh/h	1173			3317	868	
Approach Delay, s/veh	8.0			21.4	47.2	
Approach LOS	A			C	D	

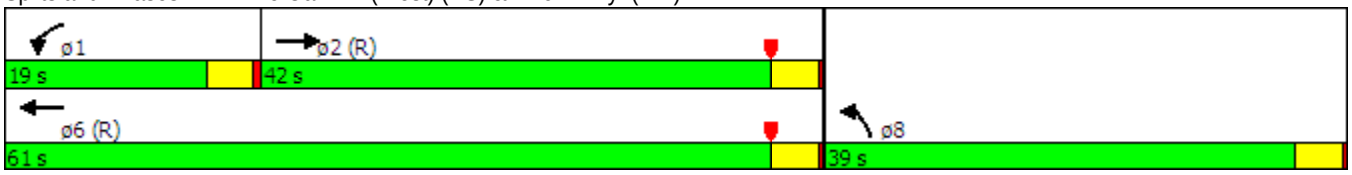
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		72.0				72.0		28.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		67.0				67.0		24.0
Max Q Clear Time (g_c+I1), s		15.3				58.6		22.4
Green Ext Time (p_c), s		51.5				8.4		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	22.6
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1015	0	398	1034	952	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	42.0		19.0	61.0	39.0	
Total Split (%)	42.0%		19.0%	61.0%	39.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1015	0	398	1034	952	304
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	1103	0	433	1124	1035	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1510	0	490	2158	1131	520
Arrive On Green	0.42	0.00	0.28	1.00	0.32	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	1103	0	433	1124	1035	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	25.6	0.0	11.8	0.0	28.3	0.0
Cycle Q Clear(g_c), s	25.6	0.0	11.8	0.0	28.3	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1510	0	490	2158	1131	520
V/C Ratio(X)	0.73	0.00	0.88	0.52	0.91	0.00
Avail Cap(c_a), veh/h	1510	0	527	2158	1229	565
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.4	0.0	35.3	0.0	32.6	0.0
Incr Delay (d2), s/veh	3.2	0.0	14.9	0.9	10.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	13.4	0.0	6.7	0.3	15.3	0.0
LnGrp Delay(d),s/veh	27.5	0.0	50.2	0.9	42.8	0.0
LnGrp LOS	C		D	A	D	
Approach Vol, veh/h	1103			1557	1035	
Approach Delay, s/veh	27.5			14.6	42.8	
Approach LOS	C			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	18.0	45.8				63.8		36.2
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	15.0	38.0				57.0		35.0
Max Q Clear Time (g_c+I1), s	13.8	27.6				2.0		30.3
Green Ext Time (p_c), s	0.2	9.9				44.9		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

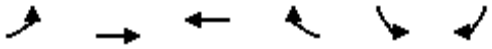
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	208	1096	1123	232	448	343
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	21.0	69.5	48.5	48.5	30.5	30.5
Total Split (%)	21.0%	69.5%	48.5%	48.5%	30.5%	30.5%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	208	1096	1123	232	448	343
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	226	1191	1221	252	487	373
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	257	2326	1705	763	880	405
Arrive On Green	0.19	0.86	0.94	0.94	0.25	0.25
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	226	1191	1221	252	487	373
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	12.1	8.4	5.8	1.3	12.1	22.5
Cycle Q Clear(g_c), s	12.1	8.4	5.8	1.3	12.1	22.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	257	2326	1705	763	880	405
V/C Ratio(X)	0.88	0.51	0.72	0.33	0.55	0.92
Avail Cap(c_a), veh/h	326	2326	1705	763	913	420
HCM Platoon Ratio	1.33	1.33	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.94	0.94	1.00	1.00
Uniform Delay (d), s/veh	39.7	3.2	1.6	1.5	32.6	36.5
Incr Delay (d2), s/veh	17.0	0.8	2.4	1.1	0.7	25.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	7.2	4.3	2.6	0.6	5.9	20.8
LnGrp Delay(d),s/veh	56.8	4.0	4.1	2.6	33.3	61.5
LnGrp LOS	E	A	A	A	C	E
Approach Vol, veh/h		1417	1473		860	
Approach Delay, s/veh		12.4	3.8		45.5	
Approach LOS		B	A		D	

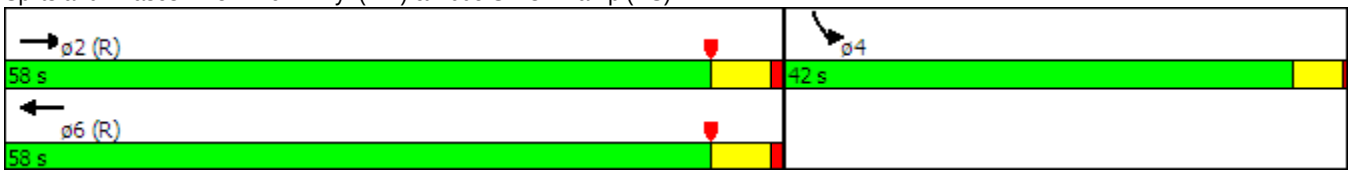
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		70.4		29.6	17.2	53.2		
Change Period (Y+Rc), s		6.0		4.5	3.0	6.0		
Max Green Setting (Gmax), s		63.5		26.0	18.0	42.5		
Max Q Clear Time (g_c+I1), s		10.4		24.5	14.1	7.8		
Green Ext Time (p_c), s		47.8		0.6	0.1	32.3		

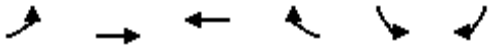
Intersection Summary	
HCM 2010 Ctrl Delay	16.6
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	1534	878	0	320	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		58.0	58.0		42.0	
Total Split (%)		58.0%	58.0%		42.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

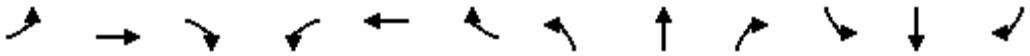




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	1534	878	0	320	464
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	1667	954	0	348	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	3567	2482	0	391	349
Arrive On Green	0.00	1.00	0.69	0.00	0.22	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	1667	954	0	348	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	11.2	0.0	18.7	0.0
Cycle Q Clear(g_c), s	0.0	0.0	11.2	0.0	18.7	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	3567	2482	0	391	349
V/C Ratio(X)	0.00	0.47	0.38	0.00	0.89	0.00
Avail Cap(c_a), veh/h	0	3567	2482	0	686	612
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.83	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	6.6	0.0	38.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.5	0.0	7.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.1	5.7	0.0	10.1	0.0
LnGrp Delay(d),s/veh	0.0	0.4	7.1	0.0	45.3	0.0
LnGrp LOS		A	A		D	
Approach Vol, veh/h		1667	954		348	
Approach Delay, s/veh		0.4	7.1		45.3	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		74.3		25.7		74.3		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		52.5		37.9		52.5		
Max Q Clear Time (g_c+I1), s		2.0		20.7		13.2		
Green Ext Time (p_c), s		50.0		1.0		39.0		

Intersection Summary	
HCM 2010 Ctrl Delay	7.8
HCM 2010 LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			
Volume (vph)	0	1558	17	0	878	369	0	0	35	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1558	17	0	878	369	0	0	35	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1657	18	0	934	393	0	0	37	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	934	0	0	1657	0	0	2124	2591	829
Stage 1	-	-	-	-	-	-	1657	1657	-
Stage 2	-	-	-	-	-	-	467	934	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	741	-	-	394	-	0	44	26	318
Stage 1	-	-	-	-	-	0	143	157	-
Stage 2	-	-	-	-	-	0	603	347	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	741	-	-	394	-	-	44	0	318
Mov Cap-2 Maneuver	-	-	-	-	-	-	44	0	-
Stage 1	-	-	-	-	-	-	143	0	-
Stage 2	-	-	-	-	-	-	603	0	-

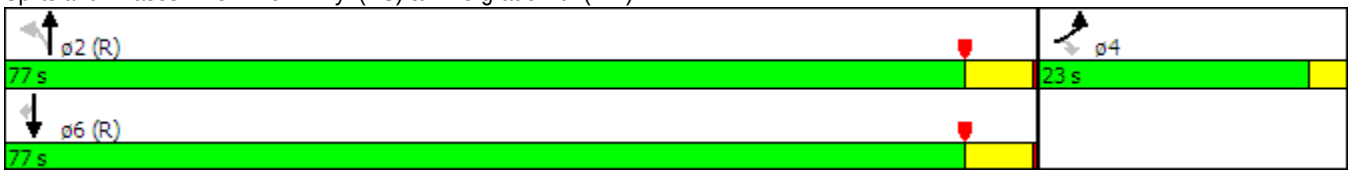
Approach	EB	WB	NB
HCM Control Delay, s	0	0	17.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	318	741	-	-	394	-
HCM Lane V/C Ratio	0.117	-	-	-	-	-
HCM Control Delay (s)	17.8	0	-	-	0	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	172	19	21	1049	1314	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			931	1292	
Travel Time (s)	15.2			14.1	19.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	23.0	23.0	77.0	77.0	77.0	77.0
Total Split (%)	23.0%	23.0%	77.0%	77.0%	77.0%	77.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 5 (5%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	172	19	21	1049	1314	158
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	179	20	22	1093	1369	165
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	261	120	328	3035	3035	1358
Arrive On Green	0.07	0.07	0.84	0.84	0.84	0.84
Sat Flow, veh/h	3510	1615	344	3705	3705	1615
Grp Volume(v), veh/h	179	20	22	1093	1369	165
Grp Sat Flow(s),veh/h/ln	1755	1615	344	1805	1805	1615
Q Serve(g_s), s	5.0	1.2	1.8	6.9	9.7	1.8
Cycle Q Clear(g_c), s	5.0	1.2	11.5	6.9	9.7	1.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	261	120	328	3035	3035	1358
V/C Ratio(X)	0.69	0.17	0.07	0.36	0.45	0.12
Avail Cap(c_a), veh/h	702	323	328	3035	3035	1358
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.1	43.4	3.5	1.8	2.0	1.4
Incr Delay (d2), s/veh	3.2	0.6	0.4	0.3	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	2.5	0.5	0.2	3.5	5.0	0.8
LnGrp Delay(d),s/veh	48.3	44.0	3.9	2.2	2.5	1.6
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	199			1115	1534	
Approach Delay, s/veh	47.9			2.2	2.4	
Approach LOS	D			A	A	

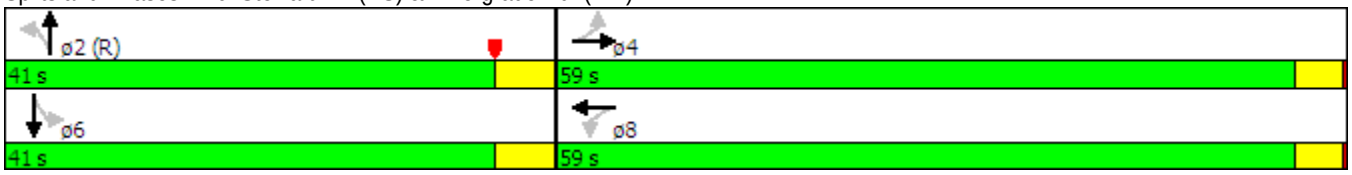
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		89.6		10.4		89.6		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		71.5		20.0		71.5		
Max Q Clear Time (g_c+I1), s		13.5		7.0		11.7		
Green Ext Time (p_c), s		37.0		0.5		37.7		

Intersection Summary	
HCM 2010 Ctrl Delay	5.5
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	146	42	329	74	3	1	2	74	4	23	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	59.0	59.0		59.0	59.0		41.0	41.0		41.0	41.0	
Total Split (%)	59.0%	59.0%		59.0%	59.0%		41.0%	41.0%		41.0%	41.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	146	42	329	74	3	1	2	74	4	23	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	3	190	55	427	96	4	1	3	96	5	30	22
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	636	1237	349	536	1571	65	726	23	740	82	460	316
Arrive On Green	0.44	0.44	0.44	0.44	0.44	0.44	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1315	2782	784	1153	3533	146	1374	49	1573	92	977	672
Grp Volume(v), veh/h	3	121	124	427	49	51	1	0	99	57	0	0
Grp Sat Flow(s),veh/h/ln	1315	1805	1762	1153	1805	1874	1374	0	1622	1741	0	0
Q Serve(g_s), s	0.1	4.0	4.2	35.1	1.5	1.6	0.0	0.0	3.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.7	4.0	4.2	39.3	1.5	1.6	0.0	0.0	3.4	1.8	0.0	0.0
Prop In Lane	1.00		0.45	1.00		0.08	1.00		0.97	0.09		0.39
Lane Grp Cap(c), veh/h	636	803	783	536	803	833	726	0	763	858	0	0
V/C Ratio(X)	0.00	0.15	0.16	0.80	0.06	0.06	0.00	0.00	0.13	0.07	0.00	0.00
Avail Cap(c_a), veh/h	775	993	969	658	993	1031	726	0	763	858	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	0.87	0.00	0.87	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.3	16.5	16.6	28.3	15.8	15.8	14.0	0.0	14.9	14.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	5.5	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	2.0	2.0	12.0	0.8	0.8	0.0	0.0	1.6	0.9	0.0	0.0
LnGrp Delay(d),s/veh	16.3	16.6	16.7	33.9	15.9	15.9	14.0	0.0	15.2	14.6	0.0	0.0
LnGrp LOS	B	B	B	C	B	B	B		B	B		
Approach Vol, veh/h		248			527			100			57	
Approach Delay, s/veh		16.6			30.4			15.2			14.6	
Approach LOS		B			C			B			B	

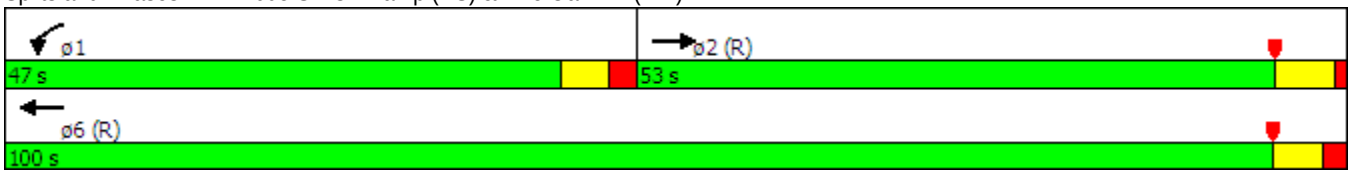
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.5		48.5		51.5		48.5
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		36.5		55.0		36.5		55.0
Max Q Clear Time (g_c+I1), s		5.4		6.2		3.8		41.3
Green Ext Time (p_c), s		0.6		4.0		0.6		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	24.2
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1445	1257	634	1648	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	53.0		47.0	100.0		
Total Split (%)	53.0%		47.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1445	1257	634	1648	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	1571	0	689	1791		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	1834	820	749	3531		
Arrive On Green	0.51	0.00	0.83	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	1571	0	689	1791		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	37.9	0.0	27.5	0.0		
Cycle Q Clear(g_c), s	37.9	0.0	27.5	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	1834	820	749	3531		
V/C Ratio(X)	0.86	0.00	0.92	0.51		
Avail Cap(c_a), veh/h	1834	820	749	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	21.4	0.0	7.4	0.0		
Incr Delay (d2), s/veh	5.4	0.0	18.3	0.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	20.1	0.0	16.1	0.3		
LnGrp Delay(d),s/veh	26.8	0.0	25.7	0.5		
LnGrp LOS	C		C	A		
Approach Vol, veh/h	1571			2480		
Approach Delay, s/veh	26.8			7.5		
Approach LOS	C			A		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	47.0	56.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	41.4	* 48				94.4		
Max Q Clear Time (g_c+I1), s	29.5	39.9				2.0		
Green Ext Time (p_c), s	4.3	7.5				87.4		

Intersection Summary	
HCM 2010 Ctrl Delay	15.0
HCM 2010 LOS	B

Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	1445	0	0	1392	0	0	0	633	0	0	889
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	196.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1445	0	0	1392	0	0	0	633	0	0	889
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1490	0	0	1435	0	0	0	653	0	0	916

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1435	0	0	1490	0	0	2208	2925	745	2180	2925	718
Stage 1	-	-	-	-	-	-	1490	1490	-	1435	1435	-
Stage 2	-	-	-	-	-	-	718	1435	-	745	1490	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	479	-	-	457	-	-	25	15	~ 361	26	15	~ 376
Stage 1	-	-	-	-	-	-	132	189	-	143	201	-
Stage 2	-	-	-	-	-	-	391	201	-	377	189	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	479	-	-	457	-	-	-	15	~ 361	-	15	~ 376
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	15	-	-	15	-
Stage 1	-	-	-	-	-	-	132	189	-	143	201	-
Stage 2	-	-	-	-	-	-	-	201	-	-	189	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	$ 399.5	$ 677.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	361	479	-	-	457	-	-	376
HCM Lane V/C Ratio	1.808	-	-	-	-	-	-	2.437
HCM Control Delay (s)	$ 399.5	0	-	-	0	-	-	$ 677.3
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	42.2	0	-	-	0	-	-	72.3

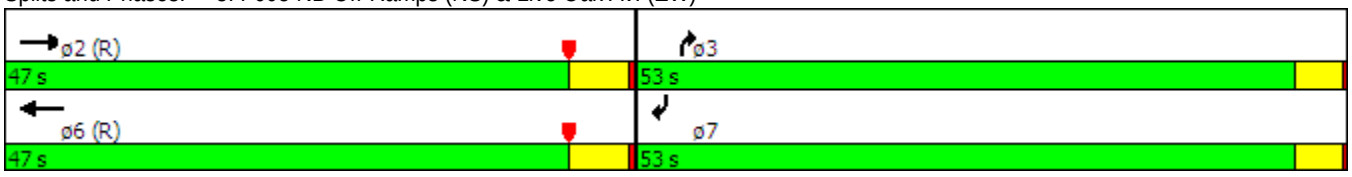
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

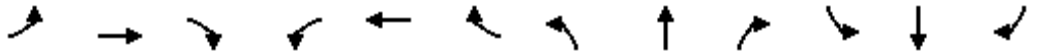
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1445	0	0	1392	0	0	0	633	0	0	889
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Detector Phase		2			6				3			7
Switch Phase												
Minimum Initial (s)		10.0			10.0				4.0			4.0
Minimum Split (s)		21.0			21.0				8.0			8.0
Total Split (s)		47.0			47.0				53.0			53.0
Total Split (%)		47.0%			47.0%				53.0%			53.0%
Yellow Time (s)		4.5			4.5				3.5			3.5
All-Red Time (s)		0.5			0.5				0.5			0.5
Lost Time Adjust (s)		0.0			0.0				0.0			0.0
Total Lost Time (s)		5.0			5.0				4.0			4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max				None			None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1445	0	0	1392	0	0	0	633	0	0	889
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	0	0	1900	0	0	0	1900	0	0	1900
Adj Flow Rate, veh/h	0	1490	0	0	1435	0	0	0	653	0	0	916
Adj No. of Lanes	0	2	0	0	3	0	0	0	2	0	0	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	3430	0	0	4928	0	0	0	0	0	0	0
Arrive On Green	0.00	0.31	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	3800	0	0	5529	0		0			0	
Grp Volume(v), veh/h	0	1490	0	0	1435	0		0.0			0.0	
Grp Sat Flow(s),veh/h/ln	0	1805	0	0	1729	0						
Q Serve(g_s), s	0.0	32.8	0.0	0.0	12.3	0.0						
Cycle Q Clear(g_c), s	0.0	32.8	0.0	0.0	12.3	0.0						
Prop In Lane	0.00		0.00	0.00		0.00						
Lane Grp Cap(c), veh/h	0	3430	0	0	4928	0						
V/C Ratio(X)	0.00	0.43	0.00	0.00	0.29	0.00						
Avail Cap(c_a), veh/h	0	3430	0	0	4928	0						
HCM Platoon Ratio	1.00	0.33	1.00	1.00	0.67	1.00						
Upstream Filter(I)	0.00	0.28	0.00	0.00	0.89	0.00						
Uniform Delay (d), s/veh	0.0	13.0	0.0	0.0	3.2	0.0						
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(-26165%),veh/ln	0.0	16.4	0.0	0.0	6.0	0.0						
LnGrp Delay(d),s/veh	0.0	13.1	0.0	0.0	3.3	0.0						
LnGrp LOS		B			A							
Approach Vol, veh/h		1490			1435							
Approach Delay, s/veh		13.1			3.3							
Approach LOS		B			A							

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		
Phs Duration (G+Y+Rc), s		100.0				100.0		
Change Period (Y+Rc), s		5.0				5.0		
Max Green Setting (Gmax), s		42.0				42.0		
Max Q Clear Time (g_c+I1), s		34.8				14.3		
Green Ext Time (p_c), s		7.1				26.3		

Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2029	49	36	1373	19	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	66.0	66.0	8.0	74.0	26.0	
Total Split (%)	66.0%	66.0%	8.0%	74.0%	26.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



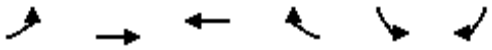
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2029	49	36	1373	19	23
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2205	53	39	1492	21	25
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	3006	1345	49	3212	27	32
Arrive On Green	1.00	1.00	0.05	1.00	0.04	0.04
Sat Flow, veh/h	3705	1615	1810	3705	761	905
Grp Volume(v), veh/h	2205	53	39	1492	47	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1702	0
Q Serve(g_s), s	0.0	0.0	2.1	0.0	2.7	0.0
Cycle Q Clear(g_c), s	0.0	0.0	2.1	0.0	2.7	0.0
Prop In Lane		1.00	1.00		0.45	0.53
Lane Grp Cap(c), veh/h	3006	1345	49	3212	60	0
V/C Ratio(X)	0.73	0.04	0.79	0.46	0.79	0.00
Avail Cap(c_a), veh/h	3006	1345	90	3212	392	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	47.0	0.0	47.9	0.0
Incr Delay (d2), s/veh	1.6	0.1	9.9	0.5	19.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	0.0	1.2	0.2	1.6	0.0
LnGrp Delay(d),s/veh	1.6	0.1	56.8	0.5	67.7	0.0
LnGrp LOS	A	A	E	A	E	
Approach Vol, veh/h	2258			1531	47	
Approach Delay, s/veh	1.6			1.9	67.7	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.7	87.8				93.5		6.5
Change Period (Y+Rc), s	3.0	4.5				4.5		3.0
Max Green Setting (Gmax), s	5.0	61.5				69.5		23.0
Max Q Clear Time (g_c+I1), s	4.1	2.0				2.0		4.7
Green Ext Time (p_c), s	0.0	57.4				64.8		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	2.5
HCM 2010 LOS	A

Notes

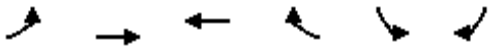
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	50	1982	1321	7	12	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	50	1982	1321	7	12	76
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	53	2086	1391	7	13	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.78				0.44	0.78
vC, conflicting volume	1398				2539	695
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	943				0	41
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				97	90
cM capacity (veh/h)	573				410	800

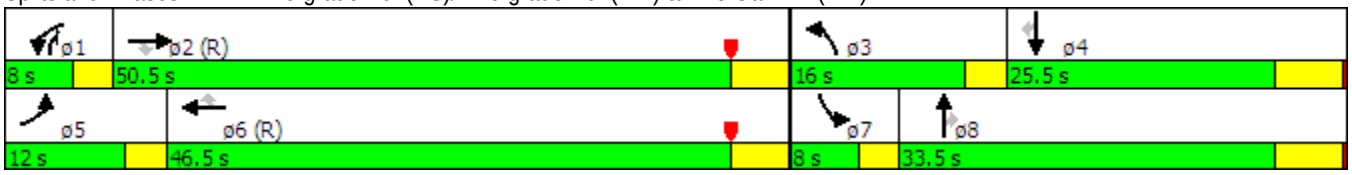
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	53	1043	1043	695	695	7	93
Volume Left	53	0	0	0	0	0	13
Volume Right	0	0	0	0	0	7	80
cSH	573	1700	1700	1700	1700	1700	708
Volume to Capacity	0.09	0.61	0.61	0.41	0.41	0.00	0.13
Queue Length 95th (ft)	8	0	0	0	0	0	11
Control Delay (s)	11.9	0.0	0.0	0.0	0.0	0.0	10.8
Lane LOS	B						B
Approach Delay (s)	0.3			0.0			10.8
Approach LOS							B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1882	35	90	1150	7	117	71	399	29	22	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	12.0	50.5	50.5	8.0	46.5	46.5	16.0	33.5	8.0	8.0	25.5	25.5
Total Split (%)	12.0%	50.5%	50.5%	8.0%	46.5%	46.5%	16.0%	33.5%	8.0%	8.0%	25.5%	25.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	85	1882	35	90	1150	7	117	71	399	29	22	63
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	89	1981	0	95	1211	7	123	75	420	31	23	66
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	113	1805	807	90	1759	787	152	507	512	42	744	333
Arrive On Green	0.08	0.66	0.00	0.10	0.97	0.97	0.08	0.27	0.27	0.01	0.07	0.07
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	89	1981	0	95	1211	7	123	75	420	31	23	66
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	4.8	50.0	0.0	5.0	2.6	0.0	6.7	3.0	24.0	1.7	0.6	3.9
Cycle Q Clear(g_c), s	4.8	50.0	0.0	5.0	2.6	0.0	6.7	3.0	24.0	1.7	0.6	3.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	113	1805	807	90	1759	787	152	507	512	42	744	333
V/C Ratio(X)	0.79	1.10	0.00	1.05	0.69	0.01	0.81	0.15	0.82	0.74	0.03	0.20
Avail Cap(c_a), veh/h	163	1805	807	90	1759	787	235	532	533	90	744	333
HCM Platoon Ratio	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	16.8	0.0	45.0	0.7	0.7	45.0	28.0	31.5	49.3	37.3	38.8
Incr Delay (d2), s/veh	8.8	53.2	0.0	101.3	1.9	0.0	5.7	0.2	10.4	9.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	2.7	37.7	0.0	5.0	1.1	0.0	3.6	1.6	12.1	1.0	0.3	1.8
LnGrp Delay(d),s/veh	54.0	70.0	0.0	147.3	2.6	0.7	50.7	28.2	42.0	58.5	37.3	39.3
LnGrp LOS	D	F		F	A	A	D	C	D	E	D	D
Approach Vol, veh/h		2070			1313			618			120	
Approach Delay, s/veh		69.3			13.0			42.0			43.9	
Approach LOS		E			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	54.5	11.4	26.1	9.3	53.2	5.3	32.2
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	5.0	46.0	13.0	20.0	9.0	42.0	5.0	28.0
Max Q Clear Time (g_c+I1), s	7.0	52.0	8.7	5.9	6.8	4.6	3.7	26.0
Green Ext Time (p_c), s	0.0	0.0	0.0	3.5	0.0	35.4	0.0	0.7

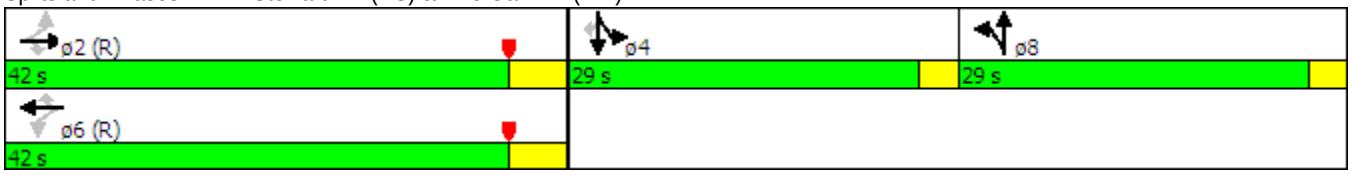
Intersection Summary	
HCM 2010 Ctrl Delay	46.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	2159	305	42	1122	1	85	23	12	25	111	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 19 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	64	2159	305	42	1122	1	85	23	12	25	111	14
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	2347	332	46	1220	1	92	25	13	27	121	15
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	404	2581	1155	152	2581	1155	119	32	17	158	165	141
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	464	3610	1615	111	3610	1615	1277	347	180	1810	1900	1615
Grp Volume(v), veh/h	70	2347	332	46	1220	1	130	0	0	27	121	15
Grp Sat Flow(s),veh/h/ln	464	1805	1615	111	1805	1615	1804	0	0	1810	1900	1615
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	1.4	6.2	0.9
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	1.4	6.2	0.9
Prop In Lane	1.00		1.00	1.00		1.00	0.71		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	404	2581	1155	152	2581	1155	168	0	0	158	165	141
V/C Ratio(X)	0.17	0.91	0.29	0.30	0.47	0.00	0.77	0.00	0.00	0.17	0.73	0.11
Avail Cap(c_a), veh/h	404	2581	1155	152	2581	1155	469	0	0	470	494	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.26	0.26	0.26	0.88	0.88	0.88	1.00	0.00	0.00	0.58	0.58	0.58
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	44.3	0.0	0.0	42.3	44.5	42.1
Incr Delay (d2), s/veh	0.2	1.7	0.2	4.5	0.6	0.0	7.4	0.0	0.0	0.3	3.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.6	0.1	0.2	0.2	0.0	3.8	0.0	0.0	0.7	3.4	0.4
LnGrp Delay(d),s/veh	0.2	1.7	0.2	4.5	0.6	0.0	51.7	0.0	0.0	42.6	48.1	42.3
LnGrp LOS	A	A	A	A	A	A	D			D	D	D
Approach Vol, veh/h		2749			1267			130			163	
Approach Delay, s/veh		1.5			0.7			51.7			46.7	
Approach LOS		A			A			D			D	

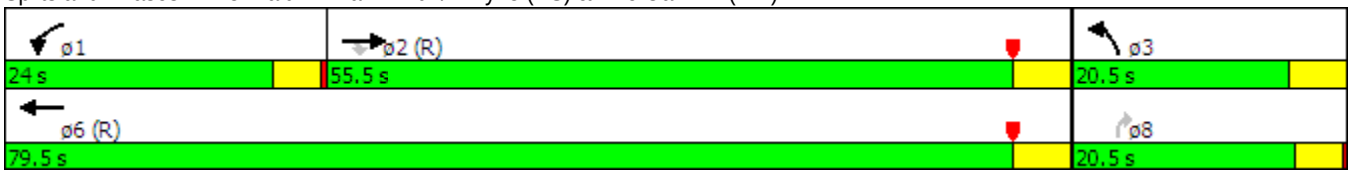
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		76.0		11.7		76.0		12.3
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		2.0		8.2		2.0		9.0
Green Ext Time (p_c), s		31.2		0.6		31.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	4.5
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1496	581	290	1214	107	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	200		100	0
Storage Lanes		1	1		1	1
Taper Length (ft)			60		60	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	1141			511	1039	
Travel Time (s)	17.3			7.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				8
Detector Phase	2	2	1	6	3	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	10.0	4.0
Minimum Split (s)	20.5	20.5	8.0	20.0	20.5	20.0
Total Split (s)	55.5	55.5	24.0	79.5	20.5	20.5
Total Split (%)	55.5%	55.5%	24.0%	79.5%	20.5%	20.5%
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5	3.5
All-Red Time (s)	0.0	0.0	0.5	0.0	0.0	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.0	4.5	4.5	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1496	581	290	1214	107	93
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	1626	632	315	1320	116	101
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1884	843	340	2708	562	258
Arrive On Green	0.35	0.35	0.38	1.00	0.16	0.16
Sat Flow, veh/h	3705	1615	1810	3705	3510	1615
Grp Volume(v), veh/h	1626	632	315	1320	116	101
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1755	1615
Q Serve(g_s), s	41.9	34.5	16.7	0.0	2.9	5.6
Cycle Q Clear(g_c), s	41.9	34.5	16.7	0.0	2.9	5.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1884	843	340	2708	562	258
V/C Ratio(X)	0.86	0.75	0.93	0.49	0.21	0.39
Avail Cap(c_a), veh/h	1884	843	362	2708	562	258
HCM Platoon Ratio	0.67	0.67	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.13	0.13	0.69	0.69	1.00	1.00
Uniform Delay (d), s/veh	29.2	26.8	30.5	0.0	36.5	37.6
Incr Delay (d2), s/veh	0.8	0.8	21.9	0.4	0.8	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	21.1	15.6	10.3	0.2	1.5	2.8
LnGrp Delay(d),s/veh	30.0	27.6	52.4	0.4	37.3	42.0
LnGrp LOS	C	C	D	A	D	D
Approach Vol, veh/h	2258			1635	217	
Approach Delay, s/veh	29.3			10.5	39.5	
Approach LOS	C			B	D	

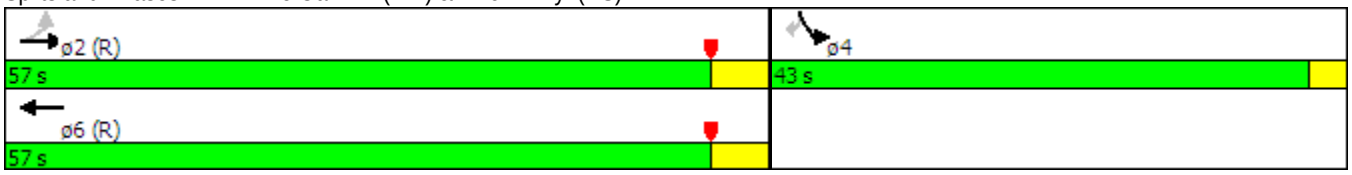
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	22.8	56.7				79.5		20.5
Change Period (Y+Rc), s	4.0	4.5				4.5		4.5
Max Green Setting (Gmax), s	20.0	51.0				75.0		16.0
Max Q Clear Time (g_c+I1), s	18.7	43.9				2.0		7.6
Green Ext Time (p_c), s	0.1	7.0				69.5		0.8

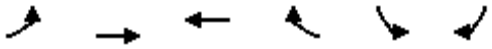
Intersection Summary	
HCM 2010 Ctrl Delay	22.3
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	43	1543	1356	0	1184	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	20.0	20.0	28.5		27.0	27.0
Total Split (s)	57.0	57.0	57.0		43.0	43.0
Total Split (%)	57.0%	57.0%	57.0%		43.0%	43.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 21 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	43	1543	1356	0	1184	148
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	44	1591	1398	0	1221	153
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	175	1978	1978	0	1324	609
Arrive On Green	0.37	0.37	0.55	0.00	0.38	0.38
Sat Flow, veh/h	392	3705	3800	0	3510	1615
Grp Volume(v), veh/h	44	1591	1398	0	1221	153
Grp Sat Flow(s),veh/h/ln	392	1805	1805	0	1755	1615
Q Serve(g_s), s	10.0	39.6	28.6	0.0	33.2	6.5
Cycle Q Clear(g_c), s	38.6	39.6	28.6	0.0	33.2	6.5
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	175	1978	1978	0	1324	609
V/C Ratio(X)	0.25	0.80	0.71	0.00	0.92	0.25
Avail Cap(c_a), veh/h	175	1978	1978	0	1404	646
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.43	0.43	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	26.8	16.7	0.0	29.8	21.4
Incr Delay (d2), s/veh	1.5	1.6	2.2	0.0	10.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.2	20.2	14.8	0.0	17.8	2.9
LnGrp Delay(d),s/veh	40.7	28.4	18.8	0.0	39.7	21.6
LnGrp LOS	D	C	B		D	C
Approach Vol, veh/h		1635	1398		1374	
Approach Delay, s/veh		28.7	18.8		37.7	
Approach LOS		C	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		59.3		40.7		59.3		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		52.5		40.0		52.5		
Max Q Clear Time (g_c+I1), s		41.6		35.2		30.6		
Green Ext Time (p_c), s		10.7		2.5		21.3		

Intersection Summary	
HCM 2010 Ctrl Delay	28.4
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2166	549	70	2093	285	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	80.0	80.0	80.0	80.0	20.0	20.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2166	549	70	2093	285	109
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2354	597	76	2275	310	118
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2708	1211	96	3890	562	258
Arrive On Green	0.75	0.75	0.75	0.75	0.16	0.16
Sat Flow, veh/h	3705	1615	85	5358	3510	1615
Grp Volume(v), veh/h	2354	597	76	2275	310	118
Grp Sat Flow(s),veh/h/ln	1805	1615	85	1729	1755	1615
Q Serve(g_s), s	46.9	14.7	28.1	19.5	8.1	6.6
Cycle Q Clear(g_c), s	46.9	14.7	75.0	19.5	8.1	6.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2708	1211	96	3890	562	258
V/C Ratio(X)	0.87	0.49	0.79	0.58	0.55	0.46
Avail Cap(c_a), veh/h	2708	1211	96	3890	562	258
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.0	5.0	45.6	5.6	38.7	38.1
Incr Delay (d2), s/veh	4.1	1.4	47.6	0.6	3.9	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	24.1	7.0	3.4	9.3	4.3	3.4
LnGrp Delay(d),s/veh	13.1	6.4	93.2	6.2	42.6	43.8
LnGrp LOS	B	A	F	A	D	D
Approach Vol, veh/h	2951			2351	428	
Approach Delay, s/veh	11.8			9.0	42.9	
Approach LOS	B			A	D	

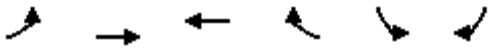
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		80.0				80.0		20.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		75.0				75.0		16.0
Max Q Clear Time (g_c+I1), s		48.9				77.0		10.1
Green Ext Time (p_c), s		26.1				0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	13.0
HCM 2010 LOS	B

VOLUME-TO-CAPACITY RATIO

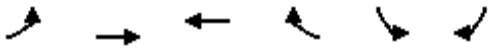
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	634	0	270	1848	1022	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	689	0	293	2009	1111	292
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	689	0	293	2009	1111	292
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	42.7		12.3	59.0	33.0	100.0
Effective Green, g (s)	42.7		12.3	59.0	33.0	100.0
Actuated g/C Ratio	0.43		0.12	0.59	0.33	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1541		430	2129	1155	1615
v/s Ratio Prot	0.19		0.08	c0.56	c0.32	
v/s Ratio Perm						0.18
v/c Ratio	0.45		0.68	0.94	0.96	0.18
Uniform Delay, d1	20.3		42.0	19.0	32.9	0.0
Progression Factor	1.00		1.27	1.06	1.00	1.00
Incremental Delay, d2	0.9		0.3	1.2	16.6	0.2
Delay (s)	21.2		53.6	21.3	49.5	0.2
Level of Service	C		D	C	D	A
Approach Delay (s)	21.2			25.4	39.3	
Approach LOS	C			C	D	

Intersection Summary			
Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



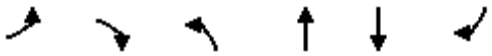
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	319	570	2027	715	203	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	347	620	2203	777	221	147
RTOR Reduction (vph)	0	0	0	265	0	130
Lane Group Flow (vph)	347	620	2203	512	221	17
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	28.4	77.9	46.5	46.5	11.6	11.6
Effective Green, g (s)	28.4	77.9	46.5	46.5	11.6	11.6
Actuated g/C Ratio	0.28	0.78	0.46	0.46	0.12	0.12
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	512	2812	1678	750	406	187
v/s Ratio Prot	c0.19	0.17	c0.61		c0.06	
v/s Ratio Perm				0.32		0.01
v/c Ratio	0.68	0.22	1.31	0.68	0.54	0.09
Uniform Delay, d1	31.7	2.9	26.8	21.0	41.7	39.5
Progression Factor	0.51	2.37	0.88	0.96	1.00	1.00
Incremental Delay, d2	2.7	0.2	143.3	2.9	1.5	0.2
Delay (s)	19.0	7.1	166.8	23.0	43.2	39.7
Level of Service	B	A	F	C	D	D
Approach Delay (s)		11.4	129.3		41.8	
Approach LOS		B	F		D	

Intersection Summary			
Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



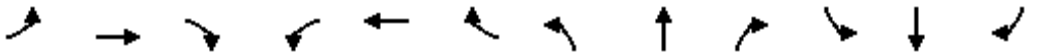
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	763	2041	0	427	697
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	812	2171	0	454	741
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	812	2171	0	454	741
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		63.9	63.9		26.5	100.0
Effective Green, g (s)		63.9	63.9		26.5	100.0
Actuated g/C Ratio		0.64	0.64		0.26	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		3314	2306		478	1615
v/s Ratio Prot		0.16	c0.60		c0.25	
v/s Ratio Perm						0.46
v/c Ratio		0.25	0.94		0.95	0.46
Uniform Delay, d1		7.7	16.4		36.1	0.0
Progression Factor		1.64	0.99		1.00	1.00
Incremental Delay, d2		0.2	6.1		28.5	0.9
Delay (s)		12.9	22.3		64.6	0.9
Level of Service		B	C		E	A
Approach Delay (s)		12.9	22.3		25.1	
Approach LOS		B	C		C	

Intersection Summary			
Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	255	13	23	2178	546	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.43	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	813	3610	3610	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	277	14	25	2367	593	360
RTOR Reduction (vph)	0	12	0	0	0	78
Lane Group Flow (vph)	277	2	25	2367	593	282
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	13.2	13.2	78.3	78.3	78.3	78.3
Effective Green, g (s)	13.2	13.2	78.3	78.3	78.3	78.3
Actuated g/C Ratio	0.13	0.13	0.78	0.78	0.78	0.78
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	462	213	636	2826	2826	1264
v/s Ratio Prot	c0.08			c0.66	0.16	
v/s Ratio Perm		0.00	0.03			0.17
v/c Ratio	0.60	0.01	0.04	0.84	0.21	0.22
Uniform Delay, d1	40.9	37.7	2.4	6.8	2.8	2.9
Progression Factor	1.47	1.93	1.28	1.04	1.76	7.04
Incremental Delay, d2	2.1	0.0	0.0	1.2	0.2	0.4
Delay (s)	62.1	72.8	3.2	8.4	5.1	20.4
Level of Service	E	E	A	A	A	C
Approach Delay (s)	62.6			8.3	10.9	
Approach LOS	E			A	B	

Intersection Summary			
Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

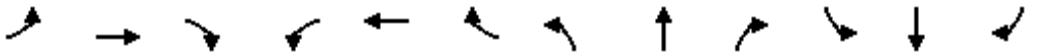


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	126	11	103	289	12	11	10	95	8	7	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3568		1805	3589		1805	1642			1749	
Flt Permitted	0.37	1.00		0.65	1.00		0.73	1.00			0.95	
Satd. Flow (perm)	702	3568		1243	3589		1396	1642			1689	
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)	28	142	12	116	325	13	12	11	107	9	8	17
RTOR Reduction (vph)	0	10	0	0	5	0	0	26	0	0	4	0
Lane Group Flow (vph)	28	144	0	116	333	0	12	92	0	0	30	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)	16.0	16.0		16.0	16.0		75.5	75.5			75.5	
Effective Green, g (s)	16.0	16.0		16.0	16.0		75.5	75.5			75.5	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.76	0.76			0.76	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	112	570		198	574		1053	1239			1275	
v/s Ratio Prot		0.04			0.09			c0.06				
v/s Ratio Perm	0.04			c0.09			0.01				0.02	
v/c Ratio	0.25	0.25		0.59	0.58		0.01	0.07			0.02	
Uniform Delay, d1	36.8	36.8		38.9	38.9		3.0	3.2			3.1	
Progression Factor	0.80	0.77		0.83	0.79		0.34	0.13			1.00	
Incremental Delay, d2	1.1	0.2		4.3	1.5		0.0	0.1			0.0	
Delay (s)	30.5	28.7		36.5	32.4		1.1	0.5			3.1	
Level of Service	C	C		D	C		A	A			A	
Approach Delay (s)		29.0			33.4			0.6			3.1	
Approach LOS		C			C			A			A	

Intersection Summary			
Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	357	727	758	1667	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	380	773	806	1773	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	380	773	806	1773	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	21.5	100.0	67.4	100.0		
Effective Green, g (s)	21.5	100.0	67.4	100.0		
Actuated g/C Ratio	0.22	1.00	0.67	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	776	1615	1216	3610		
v/s Ratio Prot	0.11		c0.45	c0.49		
v/s Ratio Perm		0.48				
v/c Ratio	0.49	0.48	0.66	0.49		
Uniform Delay, d1	34.4	0.0	9.6	0.0		
Progression Factor	0.75	1.00	0.74	1.00		
Incremental Delay, d2	2.2	1.0	2.7	0.5		
Delay (s)	27.9	1.0	9.8	0.5		
Level of Service	C	A	A	A		
Approach Delay (s)	9.9			3.4	0.0	
Approach LOS	A			A	A	

Intersection Summary			
Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	357	0	0	1629	0	0	0	731	0	0	796
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0				4.0			4.0
Lane Util. Factor		0.95			0.91				0.88			1.00
Frt		1.00			1.00				0.85			0.86
Flt Protected		1.00			1.00				1.00			1.00
Satd. Flow (prot)		3610			5187				2842			1644
Flt Permitted		1.00			1.00				1.00			1.00
Satd. Flow (perm)		3610			5187				2842			1644
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	368	0	0	1679	0	0	0	754	0	0	821
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	239	0	0	10
Lane Group Flow (vph)	0	368	0	0	1679	0	0	0	515	0	0	811
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Actuated Green, G (s)		38.0			38.0				53.0			53.0
Effective Green, g (s)		38.0			38.0				53.0			53.0
Actuated g/C Ratio		0.38			0.38				0.53			0.53
Clearance Time (s)		5.0			5.0				4.0			4.0
Vehicle Extension (s)		4.5			4.5				3.0			3.0
Lane Grp Cap (vph)		1371			1971				1506			871
v/s Ratio Prot		0.10			c0.32				0.18			c0.49
v/s Ratio Perm												
v/c Ratio		0.27			0.85				0.34			0.93
Uniform Delay, d1		21.4			28.4				13.5			21.8
Progression Factor		0.32			1.01				1.00			1.00
Incremental Delay, d2		0.4			4.0				0.1			16.2
Delay (s)		7.2			32.6				13.6			38.0
Level of Service		A			C				B			D
Approach Delay (s)		7.2			32.6			13.6			38.0	
Approach LOS		A			C			B			D	

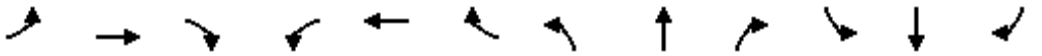
Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	974	114	51	1465	164	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	3610	1615	1805	3610	1766	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	3610	1615	1805	3610	1766	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1059	124	55	1592	178	67
RTOR Reduction (vph)	0	18	0	0	15	0
Lane Group Flow (vph)	1059	106	55	1592	230	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	66.1	66.1	5.2	74.3	18.2	
Effective Green, g (s)	66.1	66.1	5.2	74.3	18.2	
Actuated g/C Ratio	0.66	0.66	0.05	0.74	0.18	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2386	1067	93	2682	321	
v/s Ratio Prot	0.29		0.03	c0.44	c0.13	
v/s Ratio Perm		0.07				
v/c Ratio	0.44	0.10	0.59	0.59	0.72	
Uniform Delay, d1	8.1	6.2	46.4	5.9	38.5	
Progression Factor	0.92	1.01	0.73	2.51	1.00	
Incremental Delay, d2	0.6	0.2	5.5	0.8	7.4	
Delay (s)	8.1	6.4	39.1	15.6	45.9	
Level of Service	A	A	D	B	D	
Approach Delay (s)	7.9			16.4	45.9	
Approach LOS	A			B	D	

Intersection Summary			
Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	759	97	278	1305	14	54	54	115	32	82	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
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)	107	825	105	302	1418	15	59	59	125	35	89	84
RTOR Reduction (vph)	0	0	53	0	0	6	0	0	60	0	0	76
Lane Group Flow (vph)	107	825	52	302	1418	9	59	59	65	35	89	8
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.3	49.4	49.4	19.9	58.0	58.0	5.4	10.0	29.9	4.7	9.3	9.3
Effective Green, g (s)	11.3	49.4	49.4	19.9	58.0	58.0	5.4	10.0	29.9	4.7	9.3	9.3
Actuated g/C Ratio	0.11	0.49	0.49	0.20	0.58	0.58	0.05	0.10	0.30	0.05	0.09	0.09
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	203	1783	797	359	2093	936	97	190	482	84	335	150
v/s Ratio Prot	0.06	0.23		c0.17	c0.39		c0.03	c0.03	0.03	0.02	0.02	
v/s Ratio Perm			0.03			0.01			0.01			0.00
v/c Ratio	0.53	0.46	0.07	0.84	0.68	0.01	0.61	0.31	0.13	0.42	0.27	0.05
Uniform Delay, d1	41.8	16.6	13.2	38.5	14.5	8.9	46.3	41.8	25.6	46.3	42.2	41.3
Progression Factor	0.95	0.72	1.74	1.27	0.39	1.00	1.00	1.00	1.00	0.42	0.22	0.11
Incremental Delay, d2	1.0	0.8	0.1	7.2	0.8	0.0	7.2	1.6	0.0	1.2	0.7	0.2
Delay (s)	40.6	12.7	23.2	56.2	6.5	8.9	53.5	43.4	25.6	20.4	9.9	5.0
Level of Service	D	B	C	E	A	A	D	D	C	C	A	A
Approach Delay (s)		16.6			15.1			36.7			9.7	
Approach LOS		B			B			D			A	

Intersection Summary			
Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



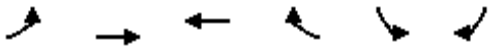
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	695	33	19	1676	39	242	132	35	14	30	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1824		1805	1900	1615
Flt Permitted	0.08	1.00	1.00	0.30	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	144	3610	1615	576	3610	1615		1824		1805	1900	1615
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)	23	755	36	21	1822	42	263	143	38	15	33	91
RTOR Reduction (vph)	0	0	17	0	0	16	0	3	0	0	0	85
Lane Group Flow (vph)	23	755	19	21	1822	26	0	441	0	15	33	6
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	52.6	52.6	52.6	52.6	52.6	52.6		30.6		6.3	6.3	6.3
Effective Green, g (s)	52.6	52.6	52.6	52.6	52.6	52.6		30.6		6.3	6.3	6.3
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53	0.53		0.31		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	75	1898	849	302	1898	849		558		113	119	101
v/s Ratio Prot		0.21			c0.50			c0.24		0.01	c0.02	
v/s Ratio Perm	0.16		0.01	0.04		0.02						0.00
v/c Ratio	0.31	0.40	0.02	0.07	0.96	0.03		0.79		0.13	0.28	0.06
Uniform Delay, d1	13.4	14.2	11.4	11.7	22.7	11.4		31.8		44.3	44.7	44.1
Progression Factor	1.85	1.91	3.46	1.11	1.02	1.23		1.00		1.88	1.86	4.48
Incremental Delay, d2	9.5	0.6	0.0	0.3	10.8	0.1		7.3		0.5	1.3	0.2
Delay (s)	34.3	27.7	39.4	13.2	33.9	14.1		39.1		83.6	84.3	197.7
Level of Service	C	C	D	B	C	B		D		F	F	F
Approach Delay (s)		28.4			33.3			39.1			158.5	
Approach LOS		C			C			D			F	

Intersection Summary				
Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	84.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	585	71	145	1533	330	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	636	77	158	1666	359	349
RTOR Reduction (vph)	0	23	0	0	0	263
Lane Group Flow (vph)	636	54	158	1666	359	86
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	48.8	48.8	13.7	66.5	24.5	24.5
Effective Green, g (s)	48.8	48.8	13.7	66.5	24.5	24.5
Actuated g/C Ratio	0.49	0.49	0.14	0.66	0.24	0.24
Clearance Time (s)	4.5	4.5	4.0	4.5	4.5	4.5
Vehicle Extension (s)	4.5	4.5	3.0	4.5	4.5	4.5
Lane Grp Cap (vph)	1761	788	247	2400	857	395
v/s Ratio Prot	0.18		0.09	c0.46	c0.10	
v/s Ratio Perm		0.03				0.05
v/c Ratio	0.36	0.07	0.64	0.69	0.42	0.22
Uniform Delay, d1	15.9	13.6	40.8	10.4	31.8	30.1
Progression Factor	0.31	0.02	1.03	0.89	1.00	1.00
Incremental Delay, d2	0.5	0.2	4.4	1.4	1.5	1.3
Delay (s)	5.5	0.5	46.6	10.6	33.3	31.4
Level of Service	A	A	D	B	C	C
Approach Delay (s)	4.9			13.8	32.3	
Approach LOS	A			B	C	

Intersection Summary			
Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	109	796	1606	0	488	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.11	1.00	1.00		0.95	1.00
Satd. Flow (perm)	201	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	112	821	1656	0	503	74
RTOR Reduction (vph)	0	0	0	0	0	34
Lane Group Flow (vph)	112	821	1656	0	503	40
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	73.0	73.0	73.0		19.5	19.5
Effective Green, g (s)	73.0	73.0	73.0		19.5	19.5
Actuated g/C Ratio	0.73	0.73	0.73		0.20	0.20
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	146	2635	2635		682	314
v/s Ratio Prot		0.23	0.46		c0.14	
v/s Ratio Perm	c0.56					0.02
v/c Ratio	0.77	0.31	0.63		0.74	0.13
Uniform Delay, d1	8.3	4.7	6.7		37.8	33.2
Progression Factor	0.87	0.34	0.90		0.79	0.77
Incremental Delay, d2	29.3	0.3	0.4		4.1	0.2
Delay (s)	36.5	1.9	6.5		33.9	25.8
Level of Service	D	A	A		C	C
Approach Delay (s)		6.0	6.5		32.8	
Approach LOS		A	A		C	

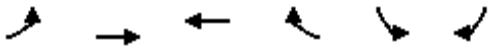
Intersection Summary			
Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	956	123	38	3014	684	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.24	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	450	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1039	134	41	3276	743	125
RTOR Reduction (vph)	0	26	0	0	0	35
Lane Group Flow (vph)	1039	108	41	3276	743	90
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	67.0	67.0	67.0	67.0	24.0	24.0
Effective Green, g (s)	67.0	67.0	67.0	67.0	24.0	24.0
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.24	0.24
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2418	1082	301	3475	840	387
v/s Ratio Prot	0.29			c0.63	c0.21	
v/s Ratio Perm		0.07	0.09			0.06
v/c Ratio	0.43	0.10	0.14	0.94	0.88	0.23
Uniform Delay, d1	7.6	5.8	6.0	14.8	36.7	30.6
Progression Factor	0.59	0.84	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.9	6.8	13.1	1.4
Delay (s)	5.1	5.1	6.9	21.5	49.8	32.0
Level of Service	A	A	A	C	D	C
Approach Delay (s)	5.1			21.4	47.2	
Approach LOS	A			C	D	

Intersection Summary			
Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

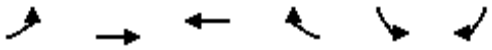
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1015	0	398	1034	952	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1103	0	433	1124	1035	330
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1103	0	433	1124	1035	330
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	40.0		14.6	58.6	33.4	100.0
Effective Green, g (s)	40.0		14.6	58.6	33.4	100.0
Actuated g/C Ratio	0.40		0.15	0.59	0.33	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1444		511	2115	1169	1615
v/s Ratio Prot	c0.31		c0.12	0.31	c0.30	
v/s Ratio Perm						0.20
v/c Ratio	0.76		0.85	0.53	0.89	0.20
Uniform Delay, d1	25.9		41.6	12.4	31.5	0.0
Progression Factor	1.00		1.37	0.70	1.14	1.00
Incremental Delay, d2	3.9		9.5	0.7	7.4	0.3
Delay (s)	29.8		66.4	9.5	43.3	0.3
Level of Service	C		E	A	D	A
Approach Delay (s)	29.8			25.3	32.9	
Approach LOS	C			C	C	

Intersection Summary			
Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



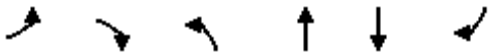
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	208	1096	1123	232	448	343
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	226	1191	1221	252	487	373
RTOR Reduction (vph)	0	0	0	123	0	273
Lane Group Flow (vph)	226	1191	1221	129	487	100
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	15.7	69.8	51.1	51.1	19.7	19.7
Effective Green, g (s)	15.7	69.8	51.1	51.1	19.7	19.7
Actuated g/C Ratio	0.16	0.70	0.51	0.51	0.20	0.20
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	283	2519	1844	825	689	318
v/s Ratio Prot	c0.13	0.33	c0.34		c0.14	
v/s Ratio Perm				0.08		0.06
v/c Ratio	0.80	0.47	0.66	0.16	0.71	0.31
Uniform Delay, d1	40.6	6.8	18.1	13.0	37.5	34.4
Progression Factor	0.45	2.30	0.77	0.81	1.00	1.00
Incremental Delay, d2	10.8	0.5	1.8	0.4	3.3	0.6
Delay (s)	29.2	16.2	15.8	11.0	40.8	34.9
Level of Service	C	B	B	B	D	C
Approach Delay (s)		18.2	14.9		38.2	
Approach LOS		B	B		D	

Intersection Summary			
Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



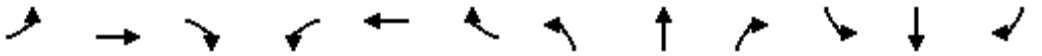
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	1534	878	0	320	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1667	954	0	348	504
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1667	954	0	348	504
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		65.6	65.6		24.8	100.0
Effective Green, g (s)		65.6	65.6		24.8	100.0
Actuated g/C Ratio		0.66	0.66		0.25	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		3402	2368		447	1615
v/s Ratio Prot		c0.32	0.26		c0.19	
v/s Ratio Perm						0.31
v/c Ratio		0.49	0.40		0.78	0.31
Uniform Delay, d1		8.7	8.0		35.0	0.0
Progression Factor		1.02	0.87		1.00	1.00
Incremental Delay, d2		0.4	0.5		8.3	0.5
Delay (s)		9.4	7.5		43.4	0.5
Level of Service		A	A		D	A
Approach Delay (s)		9.4	7.5		18.0	
Approach LOS		A	A		B	

Intersection Summary			
Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	172	19	21	1049	1314	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.18	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	343	3610	3610	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	179	20	22	1093	1369	165
RTOR Reduction (vph)	0	18	0	0	0	31
Lane Group Flow (vph)	179	2	22	1093	1369	134
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	10.4	10.4	81.1	81.1	81.1	81.1
Effective Green, g (s)	10.4	10.4	81.1	81.1	81.1	81.1
Actuated g/C Ratio	0.10	0.10	0.81	0.81	0.81	0.81
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	364	167	278	2927	2927	1309
v/s Ratio Prot	c0.05			0.30	c0.38	
v/s Ratio Perm		0.00	0.06			0.08
v/c Ratio	0.49	0.01	0.08	0.37	0.47	0.10
Uniform Delay, d1	42.3	40.2	1.9	2.6	2.9	1.9
Progression Factor	1.04	0.67	0.93	0.87	2.68	8.31
Incremental Delay, d2	1.0	0.0	0.5	0.3	0.5	0.1
Delay (s)	45.0	27.1	2.2	2.5	8.2	16.3
Level of Service	D	C	A	A	A	B
Approach Delay (s)	43.2			2.5	9.1	
Approach LOS	D			A	A	

Intersection Summary			
Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

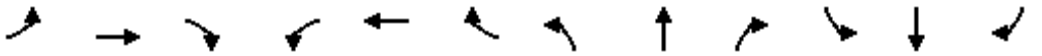


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	146	42	329	74	3	1	2	74	4	23	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.85			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1805	3488		1805	3588		1805	1624			1793	
Flt Permitted	0.69	1.00		0.60	1.00		0.72	1.00			0.99	
Satd. Flow (perm)	1309	3488		1139	3588		1368	1624			1774	
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)	3	190	55	427	96	4	1	3	96	5	30	22
RTOR Reduction (vph)	0	26	0	0	2	0	0	58	0	0	13	0
Lane Group Flow (vph)	3	219	0	427	98	0	1	41	0	0	44	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)	52.1	52.1		52.1	52.1		39.4	39.4			39.4	
Effective Green, g (s)	52.1	52.1		52.1	52.1		39.4	39.4			39.4	
Actuated g/C Ratio	0.52	0.52		0.52	0.52		0.39	0.39			0.39	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	681	1817		593	1869		538	639			698	
v/s Ratio Prot		0.06			0.03			c0.03				
v/s Ratio Perm	0.00			c0.37			0.00				0.02	
v/c Ratio	0.00	0.12		0.72	0.05		0.00	0.06			0.06	
Uniform Delay, d1	11.5	12.2		18.4	11.8		18.4	18.8			18.8	
Progression Factor	1.32	1.75		0.83	0.81		0.77	0.54			1.00	
Incremental Delay, d2	0.0	0.0		4.3	0.0		0.0	0.2			0.2	
Delay (s)	15.2	21.5		19.6	9.6		14.1	10.4			19.0	
Level of Service	B	C		B	A		B	B			B	
Approach Delay (s)		21.4			17.7			10.4			19.0	
Approach LOS		C			B			B			B	

Intersection Summary				
Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5	
Intersection Capacity Utilization	42.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1445	1257	634	1648	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1571	1366	689	1791	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1571	1366	689	1791	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	45.5	100.0	43.4	100.0		
Effective Green, g (s)	45.5	100.0	43.4	100.0		
Actuated g/C Ratio	0.46	1.00	0.43	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	1642	1615	783	3610		
v/s Ratio Prot	c0.44		0.38	0.50		
v/s Ratio Perm		c0.85				
v/c Ratio	0.96	0.85	0.88	0.50		
Uniform Delay, d1	26.3	0.0	25.9	0.0		
Progression Factor	0.88	1.00	0.86	1.00		
Incremental Delay, d2	14.0	5.6	13.2	0.5		
Delay (s)	37.1	5.6	35.5	0.5		
Level of Service	D	A	D	A		
Approach Delay (s)	22.5			10.2	0.0	
Approach LOS	C			B	A	

Intersection Summary			
Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1445	0	0	1392	0	0	0	633	0	0	889
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0				4.0			4.0
Lane Util. Factor		0.95			0.91				*1.00			1.00
Frt		1.00			1.00				1.00			1.00
Flt Protected		1.00			1.00				1.00			1.00
Satd. Flow (prot)		3610			5187				3800			1900
Flt Permitted		1.00			1.00				1.00			1.00
Satd. Flow (perm)		3610			5187				3800			1900
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	1490	0	0	1435	0	0	0	653	0	0	916
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	11	0	0	11
Lane Group Flow (vph)	0	1490	0	0	1435	0	0	0	642	0	0	905
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Actuated Green, G (s)		42.4			42.4				48.6			48.6
Effective Green, g (s)		42.4			42.4				48.6			48.6
Actuated g/C Ratio		0.42			0.42				0.49			0.49
Clearance Time (s)		5.0			5.0				4.0			4.0
Vehicle Extension (s)		4.5			4.5				3.0			3.0
Lane Grp Cap (vph)		1530			2199				1846			923
v/s Ratio Prot		c0.41			0.28				0.17			c0.48
v/s Ratio Perm												
v/c Ratio		0.97			0.65				0.35			0.98
Uniform Delay, d1		28.3			22.9				15.9			25.2
Progression Factor		0.27			1.25				1.00			1.00
Incremental Delay, d2		9.4			1.4				0.1			24.7
Delay (s)		17.1			30.0				16.0			50.0
Level of Service		B			C				B			D
Approach Delay (s)		17.1			30.0			16.0			50.0	
Approach LOS		B			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2029	49	36	1373	19	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.93	
Flt Protected	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)	3610	1615	1805	3610	1721	
Flt Permitted	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (perm)	3610	1615	1805	3610	1721	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2205	53	39	1492	21	25
RTOR Reduction (vph)	0	2	0	0	24	0
Lane Group Flow (vph)	2205	51	39	1492	22	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	81.0	81.0	3.6	87.6	4.9	
Effective Green, g (s)	81.0	81.0	3.6	87.6	4.9	
Actuated g/C Ratio	0.81	0.81	0.04	0.88	0.05	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2924	1308	64	3162	84	
v/s Ratio Prot	c0.61		c0.02	0.41	c0.01	
v/s Ratio Perm		0.03				
v/c Ratio	0.75	0.04	0.61	0.47	0.26	
Uniform Delay, d1	4.6	1.9	47.5	1.3	45.8	
Progression Factor	1.37	1.14	0.78	4.27	1.00	
Incremental Delay, d2	1.4	0.0	9.8	0.5	1.7	
Delay (s)	7.8	2.2	46.7	6.1	47.5	
Level of Service	A	A	D	A	D	
Approach Delay (s)	7.7			7.1	47.5	
Approach LOS	A			A	D	

Intersection Summary			
Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1882	35	90	1150	7	117	71	399	29	22	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	*1.00	1.00	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	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3800	1615	1805	3800	1615	1805	1900	1615	1805	3800	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3800	1615	1805	3800	1615	1805	1900	1615	1805	3800	1615
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)	89	1981	37	95	1211	7	123	75	420	31	23	66
RTOR Reduction (vph)	0	0	17	0	0	3	0	0	62	0	0	62
Lane Group Flow (vph)	89	1981	20	95	1211	4	123	75	358	31	23	4
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	8.2	54.9	54.9	13.4	60.1	60.1	9.5	11.0	24.4	4.7	6.2	6.2
Effective Green, g (s)	8.2	54.9	54.9	13.4	60.1	60.1	9.5	11.0	24.4	4.7	6.2	6.2
Actuated g/C Ratio	0.08	0.55	0.55	0.13	0.60	0.60	0.10	0.11	0.24	0.05	0.06	0.06
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	148	2086	886	241	2283	970	171	209	394	84	235	100
v/s Ratio Prot	0.05	c0.52		0.05	0.32		c0.07	0.04	c0.12	0.02	0.01	
v/s Ratio Perm			0.01			0.00			0.10			0.00
v/c Ratio	0.60	0.95	0.02	0.39	0.53	0.00	0.72	0.36	0.91	0.37	0.10	0.04
Uniform Delay, d1	44.3	21.2	10.3	39.6	11.7	8.0	44.0	41.2	36.7	46.2	44.3	44.1
Progression Factor	1.02	0.64	1.00	1.35	0.67	1.00	1.00	1.00	1.00	0.95	0.90	1.00
Incremental Delay, d2	3.3	8.3	0.0	0.3	0.8	0.0	11.4	1.8	23.7	1.0	0.3	0.3
Delay (s)	48.6	22.0	10.3	53.6	8.6	8.0	55.3	43.1	60.4	45.1	40.2	44.4
Level of Service	D	C	B	D	A	A	E	D	E	D	D	D
Approach Delay (s)		22.9			11.8			57.3			43.8	
Approach LOS		C			B			E			D	

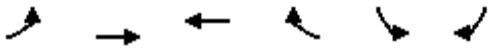
Intersection Summary			
Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	2159	305	42	1122	1	85	23	12	25	111	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1810		1805	1900	1615
Flt Permitted	0.18	1.00	1.00	0.06	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	339	3610	1615	116	3610	1615		1810		1805	1900	1615
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)	70	2347	332	46	1220	1	92	25	13	27	121	15
RTOR Reduction (vph)	0	0	59	0	0	0	0	4	0	0	0	13
Lane Group Flow (vph)	70	2347	273	46	1220	1	0	126	0	27	121	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	65.5	65.5	65.5	65.5	65.5	65.5		12.3		11.7	11.7	11.7
Effective Green, g (s)	65.5	65.5	65.5	65.5	65.5	65.5		12.3		11.7	11.7	11.7
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66	0.66		0.12		0.12	0.12	0.12
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	222	2364	1057	75	2364	1057		222		211	222	188
v/s Ratio Prot		c0.65			0.34			c0.07		0.01	c0.06	
v/s Ratio Perm	0.21		0.17	0.40		0.00						0.00
v/c Ratio	0.32	0.99	0.26	0.61	0.52	0.00		0.57		0.13	0.55	0.01
Uniform Delay, d1	7.5	17.0	7.2	9.9	9.0	6.0		41.3		39.6	41.6	39.0
Progression Factor	1.50	1.23	2.02	0.80	0.80	1.00		1.00		0.88	0.83	1.00
Incremental Delay, d2	2.1	12.4	0.3	29.3	0.7	0.0		3.3		0.2	2.5	0.0
Delay (s)	13.4	33.3	14.8	37.3	7.9	6.0		44.6		35.0	37.0	39.0
Level of Service	B	C	B	D	A	A		D		C	D	D
Approach Delay (s)		30.5			9.0			44.6			36.9	
Approach LOS		C			A			D			D	

Intersection Summary				
Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	80.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1496	581	290	1214	107	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	3610	3502	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	1805	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1626	632	315	1320	116	101
RTOR Reduction (vph)	0	79	0	0	0	84
Lane Group Flow (vph)	1626	553	315	1320	116	17
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				8
Actuated Green, G (s)	51.6	51.6	19.4	75.0	16.0	16.5
Effective Green, g (s)	51.6	51.6	19.4	75.0	16.0	16.5
Actuated g/C Ratio	0.52	0.52	0.19	0.75	0.16	0.16
Clearance Time (s)	4.5	4.5	4.0	4.5	4.5	4.0
Vehicle Extension (s)	4.5	4.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	1862	833	350	2707	560	266
v/s Ratio Prot	c0.45		c0.17	0.37	c0.03	
v/s Ratio Perm		0.34				0.01
v/c Ratio	0.87	0.66	0.90	0.49	0.21	0.06
Uniform Delay, d1	21.3	17.8	39.4	4.9	36.5	35.2
Progression Factor	1.07	1.27	0.93	1.46	1.00	1.00
Incremental Delay, d2	1.8	1.2	20.5	0.5	0.8	0.1
Delay (s)	24.5	23.8	57.2	7.7	37.3	35.3
Level of Service	C	C	E	A	D	D
Approach Delay (s)	24.3			17.2	36.4	
Approach LOS	C			B	D	

Intersection Summary			
Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	43	1543	1356	0	1184	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.10	1.00	1.00		0.95	1.00
Satd. Flow (perm)	181	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	44	1591	1398	0	1221	153
RTOR Reduction (vph)	0	0	0	0	0	18
Lane Group Flow (vph)	44	1591	1398	0	1221	135
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	54.0	54.0	54.0		38.5	38.5
Effective Green, g (s)	54.0	54.0	54.0		38.5	38.5
Actuated g/C Ratio	0.54	0.54	0.54		0.38	0.38
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	97	1949	1949		1348	621
v/s Ratio Prot		c0.44	0.39		c0.35	
v/s Ratio Perm	0.24					0.08
v/c Ratio	0.45	0.82	0.72		0.91	0.22
Uniform Delay, d1	14.0	18.9	17.3		29.0	20.6
Progression Factor	0.42	0.53	1.14		0.76	0.80
Incremental Delay, d2	7.7	2.1	1.9		8.2	0.2
Delay (s)	13.6	12.0	21.7		30.2	16.6
Level of Service	B	B	C		C	B
Approach Delay (s)		12.1	21.7		28.7	
Approach LOS		B	C		C	

Intersection Summary			
Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2166	549	70	2093	285	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.05	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	101	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2354	597	76	2275	310	118
RTOR Reduction (vph)	0	52	0	0	0	13
Lane Group Flow (vph)	2354	545	76	2275	310	105
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	75.0	75.0	75.0	75.0	16.0	16.0
Effective Green, g (s)	75.0	75.0	75.0	75.0	16.0	16.0
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.16	0.16
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2707	1211	75	3890	560	258
v/s Ratio Prot	0.65			0.44	c0.09	
v/s Ratio Perm		0.34	c0.75			0.07
v/c Ratio	0.87	0.45	1.01	0.58	0.55	0.41
Uniform Delay, d1	9.0	4.7	12.5	5.6	38.7	37.7
Progression Factor	0.85	1.01	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.7	107.7	0.6	3.9	4.7
Delay (s)	10.1	5.5	120.2	6.2	42.6	42.5
Level of Service	B	A	F	A	D	D
Approach Delay (s)	9.1			9.9	42.6	
Approach LOS	A			A	D	

Intersection Summary			
Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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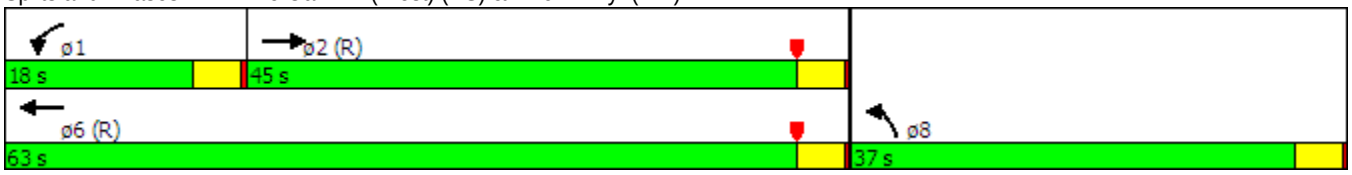
APPENDIX N:

LONG RANGE (2035) WITH PROJECT CONDITIONS INTERSECTION ANALYSIS WORKSHEETS

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	642	0	270	1858	1024	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	45.0		18.0	63.0	37.0	
Total Split (%)	45.0%		18.0%	63.0%	37.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	642	0	270	1858	1024	269
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	698	0	293	2020	1113	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1617	0	359	2130	1158	533
Arrive On Green	0.45	0.00	0.20	1.00	0.33	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	698	0	293	2020	1113	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	13.2	0.0	8.0	0.0	31.1	0.0
Cycle Q Clear(g_c), s	13.2	0.0	8.0	0.0	31.1	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1617	0	359	2130	1158	533
V/C Ratio(X)	0.43	0.00	0.82	0.95	0.96	0.00
Avail Cap(c_a), veh/h	1617	0	491	2130	1158	533
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.9	0.0	38.9	0.0	32.9	0.0
Incr Delay (d2), s/veh	0.8	0.0	6.0	10.6	17.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	6.8	0.0	4.1	3.2	17.9	0.0
LnGrp Delay(d),s/veh	19.7	0.0	44.9	10.6	50.7	0.0
LnGrp LOS	B		D	B	D	
Approach Vol, veh/h	698			2313	1113	
Approach Delay, s/veh	19.7			15.0	50.7	
Approach LOS	B			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.2	48.8				63.0		37.0
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	14.0	41.0				59.0		33.0
Max Q Clear Time (g_c+I1), s	10.0	15.2				2.0		33.1
Green Ext Time (p_c), s	0.2	24.9				53.3		0.0

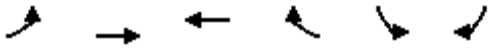
Intersection Summary	
HCM 2010 Ctrl Delay	25.4
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	319	578	2037	716	204	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	16.0	69.5	53.5	53.5	30.5	30.5
Total Split (%)	16.0%	69.5%	53.5%	53.5%	30.5%	30.5%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	319	578	2037	716	204	135
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	347	628	2214	778	222	147
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	235	2802	2225	995	417	192
Arrive On Green	0.26	1.00	0.82	0.82	0.12	0.12
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	347	628	2214	778	222	147
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	13.0	0.0	60.0	24.2	5.9	8.8
Cycle Q Clear(g_c), s	13.0	0.0	60.0	24.2	5.9	8.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	235	2802	2225	995	417	192
V/C Ratio(X)	1.48	0.22	1.00	0.78	0.53	0.77
Avail Cap(c_a), veh/h	235	2802	2225	995	913	420
HCM Platoon Ratio	2.00	2.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.31	0.31	1.00	1.00
Uniform Delay (d), s/veh	37.0	0.0	8.9	5.6	41.5	42.7
Incr Delay (d2), s/veh	235.4	0.2	9.6	2.0	1.1	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	21.8	0.1	31.3	10.7	3.0	8.0
LnGrp Delay(d),s/veh	272.4	0.2	18.5	7.6	42.5	49.0
LnGrp LOS	F	A	B	A	D	D
Approach Vol, veh/h		975	2992		369	
Approach Delay, s/veh		97.1	15.6		45.1	
Approach LOS		F	B		D	

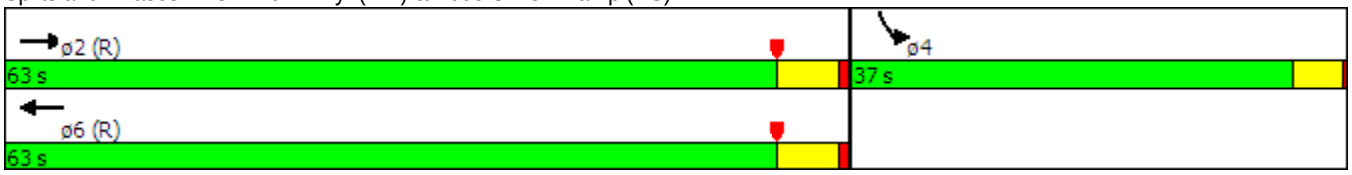
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		83.6		16.4	16.0	67.6		
Change Period (Y+Rc), s		6.0		4.5	3.0	6.0		
Max Green Setting (Gmax), s		63.5		26.0	13.0	47.5		
Max Q Clear Time (g_c+I1), s		2.0		10.8	15.0	62.0		
Green Ext Time (p_c), s		60.5		1.0	0.0	0.0		

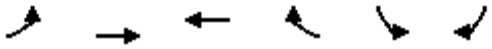
Intersection Summary	
HCM 2010 Ctrl Delay	36.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	772	2051	0	584	697
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		63.0	63.0		37.0	
Total Split (%)		63.0%	63.0%		37.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	772	2051	0	584	697
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	821	2182	0	621	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	2983	2076	0	595	531
Arrive On Green	0.00	1.00	0.57	0.00	0.33	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	821	2182	0	621	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	57.5	0.0	32.9	0.0
Cycle Q Clear(g_c), s	0.0	0.0	57.5	0.0	32.9	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	2983	2076	0	595	531
V/C Ratio(X)	0.00	0.28	1.05	0.00	1.04	0.00
Avail Cap(c_a), veh/h	0	2983	2076	0	595	531
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.96	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	21.3	0.0	33.5	0.0
Incr Delay (d2), s/veh	0.0	0.2	34.8	0.0	48.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.1	38.3	0.0	24.4	0.0
LnGrp Delay(d),s/veh	0.0	0.2	56.1	0.0	82.2	0.0
LnGrp LOS		A	F		F	
Approach Vol, veh/h		821	2182		621	
Approach Delay, s/veh		0.2	56.1		82.2	
Approach LOS		A	E		F	

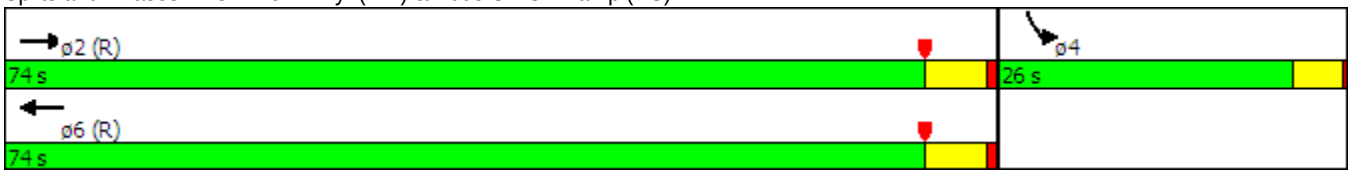
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		63.0		37.0		63.0		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		57.5		32.9		57.5		
Max Q Clear Time (g_c+I1), s		2.0		34.9		59.5		
Green Ext Time (p_c), s		55.4		0.0		0.0		

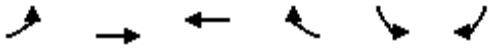
Intersection Summary	
HCM 2010 Ctrl Delay	47.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	772	2051	0	584	697
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	2	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		74.0	74.0		26.0	
Total Split (%)		74.0%	74.0%		26.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

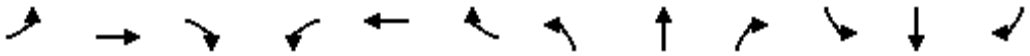




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	772	2051	0	584	697
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	821	2182	0	621	0
Adj No. of Lanes	0	3	2	0	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	3655	2544	0	700	322
Arrive On Green	0.00	1.00	0.70	0.00	0.20	0.00
Sat Flow, veh/h	0	5529	3800	0	3510	1615
Grp Volume(v), veh/h	0	821	2182	0	621	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1755	1615
Q Serve(g_s), s	0.0	0.0	45.1	0.0	17.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	45.1	0.0	17.2	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	3655	2544	0	700	322
V/C Ratio(X)	0.00	0.22	0.86	0.00	0.89	0.00
Avail Cap(c_a), veh/h	0	3655	2544	0	769	354
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.96	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	11.0	0.0	38.9	0.0
Incr Delay (d2), s/veh	0.0	0.1	4.0	0.0	11.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.0	23.5	0.0	9.5	0.0
LnGrp Delay(d),s/veh	0.0	0.1	15.0	0.0	50.5	0.0
LnGrp LOS		A	B		D	
Approach Vol, veh/h		821	2182		621	
Approach Delay, s/veh		0.1	15.0		50.5	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		76.0		24.0		76.0		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		68.5		21.9		68.5		
Max Q Clear Time (g_c+I1), s		2.0		19.2		47.1		
Green Ext Time (p_c), s		66.3		0.7		21.4		

Intersection Summary	
HCM 2010 Ctrl Delay	17.7
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	950	32	0	2051	496	0	0	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	950	32	0	2051	496	0	0	33	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	990	33	0	2136	517	0	0	34	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	2136	0	0	990	0	0	2058	3126	495
Stage 1	-	-	-	-	-	-	990	990	-
Stage 2	-	-	-	-	-	-	1068	2136	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	257	-	-	706	-	0	49	11	525
Stage 1	-	-	-	-	-	0	325	327	-
Stage 2	-	-	-	-	-	0	296	90	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	257	-	-	706	-	-	49	0	525
Mov Cap-2 Maneuver	-	-	-	-	-	-	49	0	-
Stage 1	-	-	-	-	-	-	325	0	-
Stage 2	-	-	-	-	-	-	296	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.3
HCM LOS			B

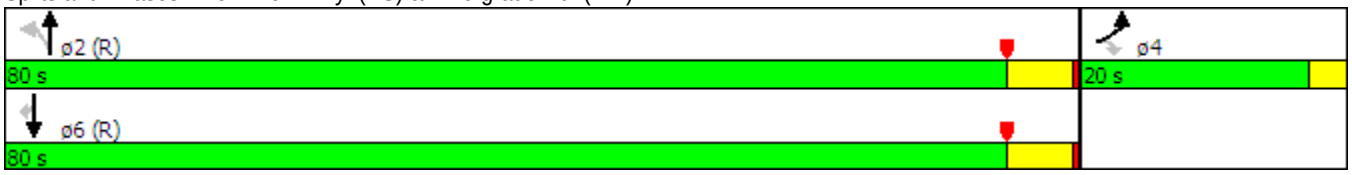
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	525	257	-	-	706	-
HCM Lane V/C Ratio	0.065	-	-	-	-	-
HCM Control Delay (s)	12.3	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	258	113	133	2335	713	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			350	1292	
Travel Time (s)	15.2			5.3	19.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	20.0	20.0	80.0	80.0	80.0	80.0
Total Split (%)	20.0%	20.0%	80.0%	80.0%	80.0%	80.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 5 (5%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	258	113	133	2335	713	331
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	280	123	145	2538	775	360
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	372	171	453	2921	2921	1307
Arrive On Green	0.11	0.11	1.00	1.00	0.81	0.81
Sat Flow, veh/h	3510	1615	504	3705	3705	1615
Grp Volume(v), veh/h	280	123	145	2538	775	360
Grp Sat Flow(s),veh/h/ln	1755	1615	504	1805	1805	1615
Q Serve(g_s), s	7.8	7.4	2.9	0.0	5.2	5.5
Cycle Q Clear(g_c), s	7.8	7.4	8.1	0.0	5.2	5.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	372	171	453	2921	2921	1307
V/C Ratio(X)	0.75	0.72	0.32	0.87	0.27	0.28
Avail Cap(c_a), veh/h	597	275	453	2921	2921	1307
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.4	43.3	0.3	0.0	2.3	2.3
Incr Delay (d2), s/veh	2.9	5.2	1.9	3.8	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.9	3.5	0.6	1.6	2.7	2.6
LnGrp Delay(d),s/veh	46.4	48.5	2.1	3.8	2.5	2.9
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	403			2683	1135	
Approach Delay, s/veh	47.0			3.7	2.6	
Approach LOS	D			A	A	

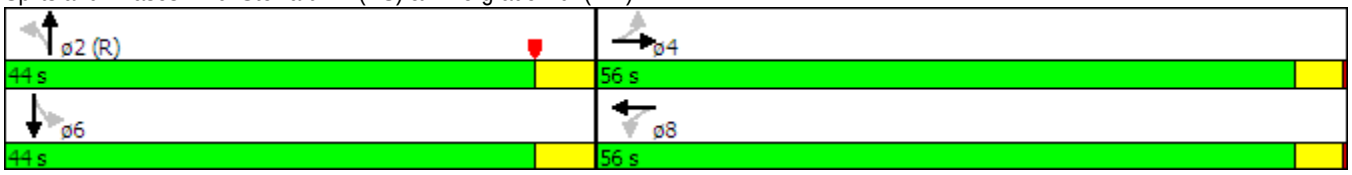
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		86.4		13.6		86.4		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		74.5		17.0		74.5		
Max Q Clear Time (g_c+I1), s		10.1		9.8		7.5		
Green Ext Time (p_c), s		54.1		0.8		55.9		

Intersection Summary	
HCM 2010 Ctrl Delay	7.6
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	223	11	105	397	13	11	10	100	9	7	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	56.0	56.0		56.0	56.0		44.0	44.0		44.0	44.0	
Total Split (%)	56.0%	56.0%		56.0%	56.0%		44.0%	44.0%		44.0%	44.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	223	11	105	397	13	11	10	100	9	7	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	28	251	12	118	446	15	12	11	112	10	8	17
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	182	797	38	262	809	27	1043	101	1025	330	272	525
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.69	0.69	0.69	0.69	0.69	0.69
Sat Flow, veh/h	946	3509	167	1134	3564	120	1408	146	1491	412	395	762
Grp Volume(v), veh/h	28	129	134	118	226	235	12	0	123	35	0	0
Grp Sat Flow(s),veh/h/ln	946	1805	1871	1134	1805	1879	1408	0	1637	1570	0	0
Q Serve(g_s), s	2.7	5.9	6.0	9.7	11.0	11.1	0.0	0.0	2.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	13.8	5.9	6.0	15.7	11.0	11.1	0.2	0.0	2.5	0.6	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.06	1.00		0.91	0.29		0.49
Lane Grp Cap(c), veh/h	182	410	425	262	410	427	1043	0	1126	1126	0	0
V/C Ratio(X)	0.15	0.31	0.32	0.45	0.55	0.55	0.01	0.00	0.11	0.03	0.00	0.00
Avail Cap(c_a), veh/h	459	939	973	594	939	977	1043	0	1126	1126	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	0.97	0.97	0.97	0.65	0.00	0.65	1.00	0.00	0.00
Uniform Delay (d), s/veh	40.2	32.2	32.2	38.7	34.1	34.2	4.9	0.0	5.3	5.0	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.4	0.4	1.2	1.1	1.1	0.0	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	3.0	3.1	3.1	5.6	5.9	0.1	0.0	1.2	0.3	0.0	0.0
LnGrp Delay(d),s/veh	40.6	32.5	32.5	39.9	35.3	35.2	4.9	0.0	5.4	5.0	0.0	0.0
LnGrp LOS	D	C	C	D	D	D	A		A	A		
Approach Vol, veh/h		291			579			135			35	
Approach Delay, s/veh		33.3			36.2			5.3			5.0	
Approach LOS		C			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		73.3		26.7		73.3		26.7
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		39.5		52.0		39.5		52.0
Max Q Clear Time (g_c+I1), s		4.5		15.8		2.6		17.7
Green Ext Time (p_c), s		0.6		5.1		0.6		5.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	362	727	872	1669	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	25.0		75.0	100.0		
Total Split (%)	25.0%		75.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	362	727	872	1669	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	385	0	928	1776		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.94	0.94	0.94	0.94		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	823	368	1256	3531		
Arrive On Green	0.23	0.00	1.00	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	385	0	928	1776		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	9.2	0.0	0.0	0.0		
Cycle Q Clear(g_c), s	9.2	0.0	0.0	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	823	368	1256	3531		
V/C Ratio(X)	0.47	0.00	0.74	0.50		
Avail Cap(c_a), veh/h	823	368	1256	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	33.4	0.0	0.0	0.0		
Incr Delay (d2), s/veh	1.9	0.0	3.9	0.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	4.8	0.0	1.4	0.3		
LnGrp Delay(d),s/veh	35.3	0.0	3.9	0.5		
LnGrp LOS	D		A	A		
Approach Vol, veh/h	385			2704		
Approach Delay, s/veh	35.3			1.7		
Approach LOS	D			A		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	75.0	28.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	69.4	* 20				94.4		
Max Q Clear Time (g_c+I1), s	2.0	11.2				2.0		
Green Ext Time (p_c), s	12.5	7.9				66.6		

Intersection Summary	
HCM 2010 Ctrl Delay	5.9
HCM 2010 LOS	A

Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	362	0	0	1745	0	0	0	853	0	0	796
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	201.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	362	0	0	1745	0	0	0	853	0	0	796
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	373	0	0	1799	0	0	0	879	0	0	821

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1799	0	0	373	0	0	1272	2172	187	1986	2172	899
Stage 1	-	-	-	-	-	-	373	373	-	1799	1799	-
Stage 2	-	-	-	-	-	-	899	1799	-	187	373	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	348	-	-	1197	-	-	127	47	~ 830	37	47	~ 286
Stage 1	-	-	-	-	-	-	625	622	-	85	133	-
Stage 2	-	-	-	-	-	-	304	133	-	803	622	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	348	-	-	1197	-	-	-	47	~ 830	-	47	~ 286
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	47	-	-	47	-
Stage 1	-	-	-	-	-	-	625	622	-	85	133	-
Stage 2	-	-	-	-	-	-	-	133	-	-	622	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	70.1	$ 877.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	830	348	-	-	1197	-	-	286
HCM Lane V/C Ratio	1.059	-	-	-	-	-	-	2.869
HCM Control Delay (s)	70.1	0	-	-	0	-	-	$ 877.7
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	21.5	0	-	-	0	-	-	71.2

Notes

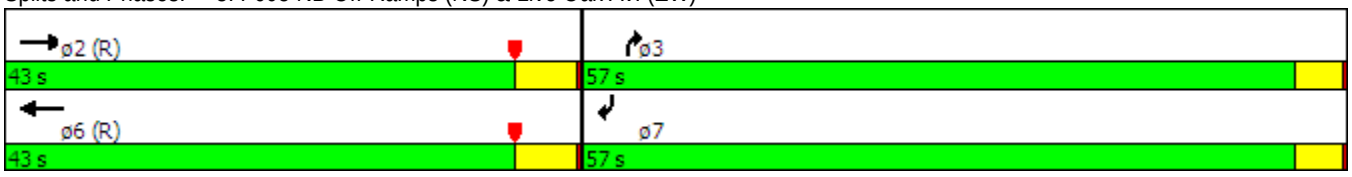
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

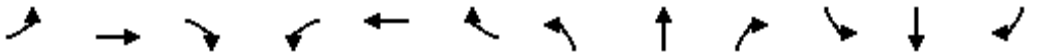
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	362	0	0	1745	0	0	0	853	0	0	796
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Detector Phase		2			6				3			7
Switch Phase												
Minimum Initial (s)		10.0			10.0				4.0			4.0
Minimum Split (s)		21.0			21.0				8.0			8.0
Total Split (s)		43.0			43.0				57.0			57.0
Total Split (%)		43.0%			43.0%				57.0%			57.0%
Yellow Time (s)		4.5			4.5				3.5			3.5
All-Red Time (s)		0.5			0.5				0.5			0.5
Lost Time Adjust (s)		0.0			0.0				0.0			0.0
Total Lost Time (s)		5.0			5.0				4.0			4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max				None			None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 66 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	362	0	0	1745	0	0	0	853	0	0	796
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0				4.0			4.0
Lane Util. Factor		0.95			0.91				0.88			1.00
Frt		1.00			1.00				0.85			0.86
Flt Protected		1.00			1.00				1.00			1.00
Satd. Flow (prot)		3610			5187				2842			1644
Flt Permitted		1.00			1.00				1.00			1.00
Satd. Flow (perm)		3610			5187				2842			1644
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	373	0	0	1799	0	0	0	879	0	0	821
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	259	0	0	11
Lane Group Flow (vph)	0	373	0	0	1799	0	0	0	620	0	0	810
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Actuated Green, G (s)		39.3			39.3				51.7			51.7
Effective Green, g (s)		39.3			39.3				51.7			51.7
Actuated g/C Ratio		0.39			0.39				0.52			0.52
Clearance Time (s)		5.0			5.0				4.0			4.0
Vehicle Extension (s)		4.5			4.5				3.0			3.0
Lane Grp Cap (vph)		1418			2038				1469			849
v/s Ratio Prot		0.10			c0.35				0.22			c0.49
v/s Ratio Perm												
v/c Ratio		0.26			0.88				0.42			0.95
Uniform Delay, d1		20.5			28.2				14.9			23.0
Progression Factor		1.90			0.94				1.00			1.00
Incremental Delay, d2		0.4			4.7				0.2			20.5
Delay (s)		39.3			31.2				15.1			43.5
Level of Service		D			C				B			D
Approach Delay (s)		39.3			31.2			15.1			43.5	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1101	114	51	1581	164	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	62.0	62.0	11.0	73.0	27.0	
Total Split (%)	62.0%	62.0%	11.0%	73.0%	27.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 10 (10%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



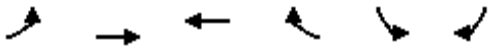
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1101	114	51	1581	164	62
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	1197	124	55	1718	178	67
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2076	929	260	2757	205	77
Arrive On Green	0.19	0.19	0.14	0.76	0.16	0.16
Sat Flow, veh/h	3705	1615	1810	3705	1268	477
Grp Volume(v), veh/h	1197	124	55	1718	246	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1752	0
Q Serve(g_s), s	30.2	6.4	2.7	21.5	13.7	0.0
Cycle Q Clear(g_c), s	30.2	6.4	2.7	21.5	13.7	0.0
Prop In Lane		1.00	1.00		0.72	0.27
Lane Grp Cap(c), veh/h	2076	929	260	2757	283	0
V/C Ratio(X)	0.58	0.13	0.21	0.62	0.87	0.00
Avail Cap(c_a), veh/h	2076	929	260	2757	421	0
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.4	19.8	37.8	5.3	40.9	0.0
Incr Delay (d2), s/veh	1.2	0.3	0.1	1.1	12.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	15.4	2.9	1.4	10.9	7.6	0.0
LnGrp Delay(d),s/veh	30.6	20.1	38.0	6.4	53.2	0.0
LnGrp LOS	C	C	D	A	D	
Approach Vol, veh/h	1321			1773	246	
Approach Delay, s/veh	29.6			7.4	53.2	
Approach LOS	C			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	18.9	62.0				80.9		19.1
Change Period (Y+Rc), s	4.5	* 4.5				4.5		3.0
Max Green Setting (Gmax), s	8.0	* 58				68.5		24.0
Max Q Clear Time (g_c+I1), s	4.7	32.2				23.5		15.7
Green Ext Time (p_c), s	3.1	11.3				30.1		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Notes

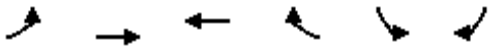
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	92	1076	1510	59	14	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	92	1076	1510	59	14	142
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	97	1133	1589	62	15	149
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.66				0.76	0.66
vC, conflicting volume	1652				2349	795
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	954				905	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	80				91	79
cM capacity (veh/h)	480				171	719

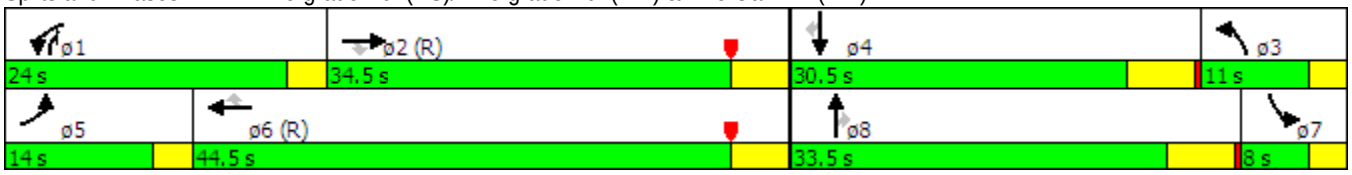
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	97	566	566	795	795	62	164
Volume Left	97	0	0	0	0	0	15
Volume Right	0	0	0	0	0	62	149
cSH	480	1700	1700	1700	1700	1700	558
Volume to Capacity	0.20	0.33	0.33	0.47	0.47	0.04	0.29
Queue Length 95th (ft)	19	0	0	0	0	0	30
Control Delay (s)	14.4	0.0	0.0	0.0	0.0	0.0	14.1
Lane LOS	B						B
Approach Delay (s)	1.1			0.0			14.1
Approach LOS							B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	792	97	280	1317	14	54	56	120	32	84	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	14.0	34.5	34.5	24.0	44.5	44.5	11.0	33.5	24.0	8.0	30.5	30.5
Total Split (%)	14.0%	34.5%	34.5%	24.0%	44.5%	44.5%	11.0%	33.5%	24.0%	8.0%	30.5%	30.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	191	792	97	280	1317	14	54	56	120	32	84	181
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	208	861	0	304	1432	15	59	61	130	35	91	197
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	199	1758	786	328	2016	902	76	148	419	169	467	209
Arrive On Green	0.07	0.33	0.00	0.36	1.00	1.00	0.04	0.08	0.08	0.16	0.22	0.22
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	208	861	0	304	1432	15	59	61	130	35	91	197
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	11.0	19.1	0.0	16.1	0.0	0.0	3.2	3.1	4.7	1.7	2.1	9.3
Cycle Q Clear(g_c), s	11.0	19.1	0.0	16.1	0.0	0.0	3.2	3.1	4.7	1.7	2.1	9.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	199	1758	786	328	2016	902	76	148	419	169	467	209
V/C Ratio(X)	1.04	0.49	0.00	0.93	0.71	0.02	0.77	0.41	0.31	0.21	0.19	0.94
Avail Cap(c_a), veh/h	199	1758	786	380	2016	902	145	532	745	169	903	404
HCM Platoon Ratio	0.67	0.67	0.67	2.00	2.00	2.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	0.00	0.22	0.22	0.22	1.00	1.00	1.00	0.72	0.72	0.72
Uniform Delay (d), s/veh	46.3	23.7	0.0	31.2	0.0	0.0	47.4	43.9	16.2	39.0	34.9	23.4
Incr Delay (d2), s/veh	76.1	1.0	0.0	7.6	0.5	0.0	6.1	3.1	0.7	0.2	0.2	20.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	9.7	9.8	0.0	8.6	0.1	0.0	1.7	1.7	2.1	0.8	1.0	5.4
LnGrp Delay(d),s/veh	122.4	24.7	0.0	38.8	0.5	0.0	53.5	47.0	16.9	39.1	35.2	44.3
LnGrp LOS	F	C		D	A	A	D	D	B	D	D	D
Approach Vol, veh/h		1069			1751			250			323	
Approach Delay, s/veh		43.7			7.1			32.9			41.2	
Approach LOS		D			A			C			D	

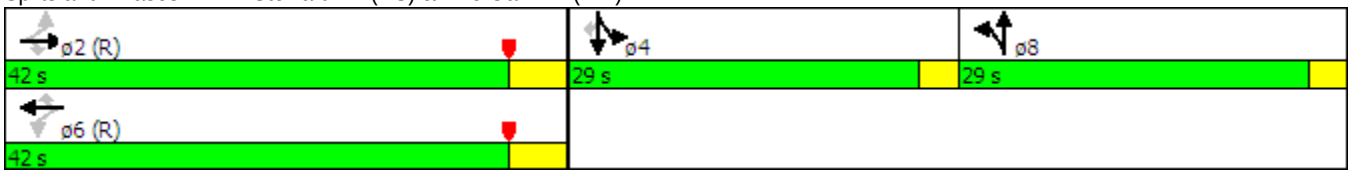
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.1	53.2	7.2	18.4	14.0	60.3	12.4	13.3
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	21.0	30.0	8.0	25.0	11.0	40.0	5.0	28.0
Max Q Clear Time (g_c+I1), s	18.1	21.1	5.2	11.3	13.0	2.0	3.7	6.7
Green Ext Time (p_c), s	0.0	8.2	0.0	1.6	0.0	29.6	0.0	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	23.8
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	733	33	21	1690	42	242	134	40	14	32	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	733	33	21	1690	42	242	134	40	14	32	84
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	23	797	36	23	1837	46	263	146	43	15	35	91
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	96	2013	900	391	2013	900	275	153	45	140	147	125
Arrive On Green	0.74	0.74	0.74	0.56	0.56	0.56	0.26	0.26	0.26	0.08	0.08	0.08
Sat Flow, veh/h	245	3610	1615	669	3610	1615	1057	587	173	1810	1900	1615
Grp Volume(v), veh/h	23	797	36	23	1837	46	452	0	0	15	35	91
Grp Sat Flow(s),veh/h/ln	245	1805	1615	669	1805	1615	1817	0	0	1810	1900	1615
Q Serve(g_s), s	9.3	8.1	0.6	1.9	45.8	1.3	24.5	0.0	0.0	0.8	1.7	5.5
Cycle Q Clear(g_c), s	55.1	8.1	0.6	9.9	45.8	1.3	24.5	0.0	0.0	0.8	1.7	5.5
Prop In Lane	1.00		1.00	1.00		1.00	0.58		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	96	2013	900	391	2013	900	472	0	0	140	147	125
V/C Ratio(X)	0.24	0.40	0.04	0.06	0.91	0.05	0.96	0.00	0.00	0.11	0.24	0.73
Avail Cap(c_a), veh/h	96	2013	900	391	2013	900	472	0	0	470	494	420
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	0.42	0.42	0.42	1.00	0.00	0.00	0.86	0.86	0.86
Uniform Delay (d), s/veh	35.6	6.8	5.8	14.2	19.9	10.1	36.4	0.0	0.0	42.9	43.4	45.1
Incr Delay (d2), s/veh	5.2	0.5	0.1	0.1	3.6	0.0	30.6	0.0	0.0	0.3	0.7	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.8	4.0	0.3	0.4	23.7	0.6	16.3	0.0	0.0	0.4	0.9	2.7
LnGrp Delay(d),s/veh	40.8	7.3	5.9	14.3	23.5	10.1	67.1	0.0	0.0	43.2	44.1	51.9
LnGrp LOS	D	A	A	B	C	B	E			D	D	D
Approach Vol, veh/h		856			1906			452			141	
Approach Delay, s/veh		8.1			23.1			67.1			49.0	
Approach LOS		A			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		60.3		10.7		60.3		29.0
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		57.1		7.5		47.8		26.5
Green Ext Time (p_c), s		0.0		0.4		0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	585	71	148	1533	43	330	10	324	12	4	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		50	200		0	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	60			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1141			511			1039			220	
Travel Time (s)		17.3			7.7			23.6			5.0	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Detector Phase	5	2	2	1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	10.0	10.0		4.0	4.0	
Minimum Split (s)	8.0	20.5	20.5	8.0	20.0	20.0	20.5	20.5		8.0	20.0	
Total Split (s)	8.0	39.5	39.5	20.0	51.5	51.5	20.5	32.5		8.0	20.0	
Total Split (%)	8.0%	39.5%	39.5%	20.0%	51.5%	51.5%	20.5%	32.5%		8.0%	20.0%	
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5		3.5	3.5	
All-Red Time (s)	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	43	585	71	148	1533	43	330	10	324	12	4	19
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	47	636	77	161	1666	47	359	11	352	13	4	21
Adj No. of Lanes	1	2	1	1	2	1	2	1	0	1	1	0
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	60	1560	698	192	1822	815	562	14	440	22	34	177
Arrive On Green	0.07	0.86	0.86	0.21	1.00	1.00	0.16	0.28	0.28	0.01	0.13	0.13
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	3510	49	1573	1810	265	1390
Grp Volume(v), veh/h	47	636	77	161	1666	47	359	0	363	13	0	25
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1755	0	1622	1810	0	1655
Q Serve(g_s), s	2.6	3.7	0.7	8.5	0.0	0.0	9.6	0.0	20.8	0.7	0.0	1.3
Cycle Q Clear(g_c), s	2.6	3.7	0.7	8.5	0.0	0.0	9.6	0.0	20.8	0.7	0.0	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.84
Lane Grp Cap(c), veh/h	60	1560	698	192	1822	815	562	0	454	22	0	210
V/C Ratio(X)	0.78	0.41	0.11	0.84	0.91	0.06	0.64	0.00	0.80	0.59	0.00	0.12
Avail Cap(c_a), veh/h	72	1560	698	290	1822	815	562	0	454	72	0	265
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.75	0.75	0.75	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.3	4.1	3.9	38.6	0.0	0.0	39.3	0.0	33.4	49.1	0.0	38.7
Incr Delay (d2), s/veh	33.0	0.7	0.3	10.0	6.8	0.1	5.5	0.0	13.7	22.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.8	1.7	0.3	4.7	1.7	0.0	5.1	0.0	11.0	0.5	0.0	0.6
LnGrp Delay(d),s/veh	79.3	4.8	4.2	48.6	6.8	0.1	44.8	0.0	47.1	72.1	0.0	38.9
LnGrp LOS	E	A	A	D	A	A	D		D	E		D
Approach Vol, veh/h		760			1874			722			38	
Approach Delay, s/veh		9.4			10.2			45.9			50.3	
Approach LOS		A			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	47.7	20.5	17.2	7.3	55.0	5.2	32.5
Change Period (Y+Rc), s	4.0	4.5	4.5	* 4.5	4.0	4.5	4.0	4.5
Max Green Setting (Gmax), s	16.0	35.0	16.0	* 16	4.0	47.0	4.0	28.0
Max Q Clear Time (g_c+I1), s	10.5	5.7	11.6	3.3	4.6	2.0	2.7	22.8
Green Ext Time (p_c), s	0.2	26.1	0.9	3.0	0.0	38.1	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B

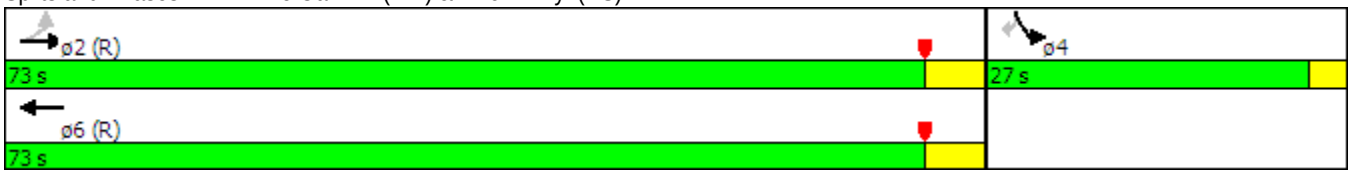
Notes

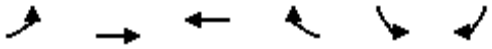
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	119	801	1620	0	500	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	20.0	20.0	28.5		27.0	27.0
Total Split (s)	73.0	73.0	73.0		27.0	27.0
Total Split (%)	73.0%	73.0%	73.0%		27.0%	27.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 33 (33%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	119	801	1620	0	500	104
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	123	826	1670	0	515	107
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	233	2703	2703	0	619	285
Arrive On Green	1.00	1.00	0.75	0.00	0.18	0.18
Sat Flow, veh/h	302	3705	3800	0	3510	1615
Grp Volume(v), veh/h	123	826	1670	0	515	107
Grp Sat Flow(s),veh/h/ln	302	1805	1805	0	1755	1615
Q Serve(g_s), s	25.9	0.0	21.6	0.0	14.2	5.8
Cycle Q Clear(g_c), s	47.5	0.0	21.6	0.0	14.2	5.8
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	233	2703	2703	0	619	285
V/C Ratio(X)	0.53	0.31	0.62	0.00	0.83	0.38
Avail Cap(c_a), veh/h	233	2703	2703	0	843	388
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	6.9	0.0	5.9	0.0	39.8	36.3
Incr Delay (d2), s/veh	7.4	0.3	1.1	0.0	5.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	2.6	0.1	11.1	0.0	7.3	2.7
LnGrp Delay(d),s/veh	14.3	0.3	6.9	0.0	45.0	37.2
LnGrp LOS	B	A	A		D	D
Approach Vol, veh/h		949	1670		622	
Approach Delay, s/veh		2.1	6.9		43.7	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		79.4		20.6		79.4		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		68.5		24.0		68.5		
Max Q Clear Time (g_c+I1), s		49.5		16.2		23.6		
Green Ext Time (p_c), s		18.2		1.5		41.0		

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	970	127	38	3033	691	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	72.0	72.0	72.0	72.0	28.0	28.0
Total Split (%)	72.0%	72.0%	72.0%	72.0%	28.0%	28.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	970	127	38	3033	691	115
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	1054	138	41	3297	751	125
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2419	1082	327	3475	843	388
Arrive On Green	0.67	0.67	0.67	0.67	0.24	0.24
Sat Flow, veh/h	3705	1615	477	5358	3510	1615
Grp Volume(v), veh/h	1054	138	41	3297	751	125
Grp Sat Flow(s),veh/h/ln	1805	1615	477	1729	1755	1615
Q Serve(g_s), s	13.6	3.1	4.4	57.6	20.7	6.4
Cycle Q Clear(g_c), s	13.6	3.1	18.0	57.6	20.7	6.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2419	1082	327	3475	843	388
V/C Ratio(X)	0.44	0.13	0.13	0.95	0.89	0.32
Avail Cap(c_a), veh/h	2419	1082	327	3475	843	388
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.7	6.0	11.9	14.9	36.7	31.3
Incr Delay (d2), s/veh	0.6	0.2	0.8	7.3	13.7	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	6.9	1.4	0.6	29.2	11.6	3.1
LnGrp Delay(d),s/veh	8.3	6.2	12.7	22.2	50.4	33.5
LnGrp LOS	A	A	B	C	D	C
Approach Vol, veh/h	1192			3338	876	
Approach Delay, s/veh	8.0			22.1	48.0	
Approach LOS	A			C	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		72.0				72.0		28.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		67.0				67.0		24.0
Max Q Clear Time (g_c+I1), s		15.6				59.6		22.7
Green Ext Time (p_c), s		51.2				7.4		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	23.2
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	255	12	10	2212	592	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			100
Storage Lanes	1	1	1			0
Taper Length (ft)	25		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			45	45	
Link Distance (ft)	296			257	167	
Travel Time (s)	6.7			3.9	2.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	23.0	23.0	8.0	77.0	69.0	69.0
Total Split (%)	23.0%	23.0%	8.0%	77.0%	69.0%	69.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	

Splits and Phases: 16: Arrow Hwy. (NS) & Driveway 1 (EW)





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	255	12	10	2212	592	170
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	268	13	11	2328	623	179
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	302	270	19	2719	2536	1135
Arrive On Green	0.17	0.17	0.01	0.75	1.00	1.00
Sat Flow, veh/h	1810	1615	1810	3705	3705	1615
Grp Volume(v), veh/h	268	13	11	2328	623	179
Grp Sat Flow(s),veh/h/ln	1810	1615	1810	1805	1805	1615
Q Serve(g_s), s	14.5	0.7	0.6	44.8	0.0	0.0
Cycle Q Clear(g_c), s	14.5	0.7	0.6	44.8	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	302	270	19	2719	2536	1135
V/C Ratio(X)	0.89	0.05	0.58	0.86	0.25	0.16
Avail Cap(c_a), veh/h	344	307	72	2719	2536	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.7	35.0	49.3	8.6	0.0	0.0
Incr Delay (d2), s/veh	21.5	0.1	24.7	3.7	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	9.0	0.7	0.4	23.1	0.1	0.1
LnGrp Delay(d),s/veh	62.3	35.1	73.9	12.3	0.2	0.3
LnGrp LOS	E	D	E	B	A	A
Approach Vol, veh/h	281			2339	802	
Approach Delay, s/veh	61.0			12.6	0.2	
Approach LOS	E			B	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		79.3		20.7	5.1	74.3		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		73.0		19.0	4.0	65.0		
Max Q Clear Time (g_c+I1), s		46.8		16.5	2.6	2.0		
Green Ext Time (p_c), s		23.4		0.2	0.0	49.4		

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	5	2	4	2463	760	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Link Speed (mph)	30			45	45	
Link Distance (ft)	301			157	350	
Travel Time (s)	6.8			2.4	5.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	5	2	4	2463	760	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	2	4	2593	800	69

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2105	400	800	0	-	0
Stage 1	800	-	-	-	-	-
Stage 2	1305	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	45	605	832	-	-	-
Stage 1	408	-	-	-	-	-
Stage 2	222	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	45	605	832	-	-	-
Mov Cap-2 Maneuver	150	-	-	-	-	-
Stage 1	408	-	-	-	-	-
Stage 2	222	-	-	-	-	-

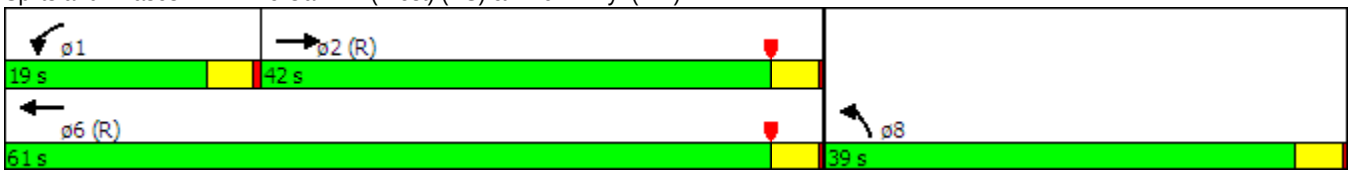
Approach	EB	NB	SB
HCM Control Delay, s	24.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	832	-	191	-	-
HCM Lane V/C Ratio	0.005	-	0.039	-	-
HCM Control Delay (s)	9.3	0	24.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1028	0	398	1045	955	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	300		0	230
Storage Lanes		0	2		1	0
Taper Length (ft)			120		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	45	
Link Distance (ft)	303			883	446	
Travel Time (s)	4.6			13.4	6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		4.0	10.0	5.0	
Minimum Split (s)	27.0		8.0	20.0	26.0	
Total Split (s)	42.0		19.0	61.0	39.0	
Total Split (%)	42.0%		19.0%	61.0%	39.0%	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	0.5		0.5	0.5	0.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: Live Oak Av. (West) (NS) & Arrow Hwy. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1028	0	398	1045	955	304
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900	1900	1900	1900
Adj Flow Rate, veh/h	1117	0	433	1136	1038	0
Adj No. of Lanes	2	0	2	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1507	0	490	2156	1134	521
Arrive On Green	0.42	0.00	0.28	1.00	0.32	0.00
Sat Flow, veh/h	3800	0	3510	3705	3510	1615
Grp Volume(v), veh/h	1117	0	433	1136	1038	0
Grp Sat Flow(s),veh/h/ln	1805	0	1755	1805	1755	1615
Q Serve(g_s), s	26.1	0.0	11.8	0.0	28.4	0.0
Cycle Q Clear(g_c), s	26.1	0.0	11.8	0.0	28.4	0.0
Prop In Lane		0.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1507	0	490	2156	1134	521
V/C Ratio(X)	0.74	0.00	0.88	0.53	0.92	0.00
Avail Cap(c_a), veh/h	1507	0	527	2156	1229	565
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.6	0.0	35.3	0.0	32.5	0.0
Incr Delay (d2), s/veh	3.3	0.0	14.9	0.9	10.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	13.6	0.0	6.7	0.3	15.3	0.0
LnGrp Delay(d),s/veh	27.9	0.0	50.2	0.9	42.8	0.0
LnGrp LOS	C		D	A	D	
Approach Vol, veh/h	1117			1569	1038	
Approach Delay, s/veh	27.9			14.5	42.8	
Approach LOS	C			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	18.0	45.8				63.7		36.3
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	15.0	38.0				57.0		35.0
Max Q Clear Time (g_c+I1), s	13.8	28.1				2.0		30.4
Green Ext Time (p_c), s	0.2	9.4				45.3		1.9

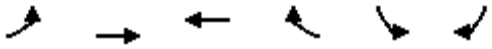
Intersection Summary	
HCM 2010 Ctrl Delay	26.4
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	208	1109	1134	233	449	343
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			0	310	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				120	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		1290	1080		495	
Travel Time (s)		19.5	16.4		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	8.0	22.0	32.0	32.0	30.5	30.5
Total Split (s)	20.0	69.5	49.5	49.5	30.5	30.5
Total Split (%)	20.0%	69.5%	49.5%	49.5%	30.5%	30.5%
Yellow Time (s)	3.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 88 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Arrow Hwy. (EW) & Aveneda Barbosa





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	208	1109	1134	233	449	343
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	226	1205	1233	253	488	373
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	257	2326	1705	763	880	405
Arrive On Green	0.19	0.86	0.94	0.94	0.25	0.25
Sat Flow, veh/h	1810	3705	3705	1615	3510	1615
Grp Volume(v), veh/h	226	1205	1233	253	488	373
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1615	1755	1615
Q Serve(g_s), s	12.2	8.6	6.0	1.3	12.1	22.5
Cycle Q Clear(g_c), s	12.2	8.6	6.0	1.3	12.1	22.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	257	2326	1705	763	880	405
V/C Ratio(X)	0.88	0.52	0.72	0.33	0.55	0.92
Avail Cap(c_a), veh/h	308	2326	1705	763	913	420
HCM Platoon Ratio	1.33	1.33	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.91	0.91	1.00	1.00
Uniform Delay (d), s/veh	39.7	3.2	1.6	1.5	32.6	36.5
Incr Delay (d2), s/veh	19.4	0.8	2.5	1.1	0.7	25.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	7.4	4.3	2.6	0.6	5.9	20.8
LnGrp Delay(d),s/veh	59.2	4.0	4.1	2.6	33.3	61.5
LnGrp LOS	E	A	A	A	C	E
Approach Vol, veh/h		1431	1486		861	
Approach Delay, s/veh		12.7	3.8		45.5	
Approach LOS		B	A		D	

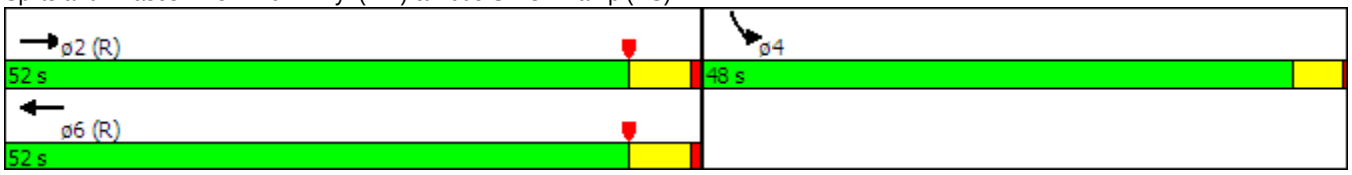
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		70.4		29.6	17.2	53.2		
Change Period (Y+Rc), s		6.0		4.5	3.0	6.0		
Max Green Setting (Gmax), s		63.5		26.0	17.0	43.5		
Max Q Clear Time (g_c+I1), s		10.6		24.5	14.2	8.0		
Green Ext Time (p_c), s		47.9		0.6	0.1	33.2		

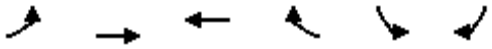
Intersection Summary	
HCM 2010 Ctrl Delay	16.7
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	1548	890	0	462	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		52.0	52.0		48.0	
Total Split (%)		52.0%	52.0%		48.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (veh/h)	0	1548	890	0	462	464
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	1683	967	0	502	0
Adj No. of Lanes	0	3	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	3120	2171	0	548	489
Arrive On Green	0.00	1.00	0.60	0.00	0.30	0.00
Sat Flow, veh/h	0	5529	3800	0	1810	1615
Grp Volume(v), veh/h	0	1683	967	0	502	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1810	1615
Q Serve(g_s), s	0.0	0.0	14.6	0.0	26.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	14.6	0.0	26.8	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	3120	2171	0	548	489
V/C Ratio(X)	0.00	0.54	0.45	0.00	0.92	0.00
Avail Cap(c_a), veh/h	0	3120	2171	0	794	709
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.82	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	10.8	0.0	33.7	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.7	0.0	11.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.2	7.5	0.0	15.2	0.0
LnGrp Delay(d),s/veh	0.0	0.6	11.5	0.0	45.3	0.0
LnGrp LOS		A	B		D	
Approach Vol, veh/h		1683	967		502	
Approach Delay, s/veh		0.6	11.5		45.3	
Approach LOS		A	B		D	

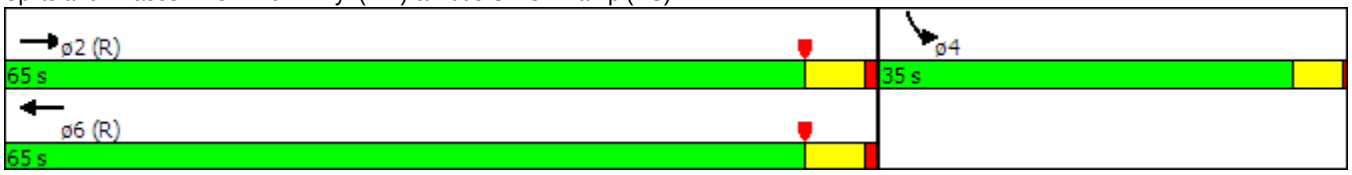
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		65.6		34.4		65.6		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		46.5		43.9		46.5		
Max Q Clear Time (g_c+I1), s		2.0		28.8		16.6		
Green Ext Time (p_c), s		44.2		1.5		29.8		

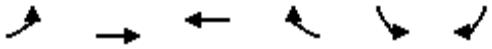
Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1548	890	0	462	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	2	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		30	
Link Distance (ft)		1080	372		706	
Travel Time (s)		16.4	5.6		16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Detector Phase		2	6		4	
Switch Phase						
Minimum Initial (s)		10.0	7.0		4.0	
Minimum Split (s)		20.0	22.0		20.0	
Total Split (s)		65.0	65.0		35.0	
Total Split (%)		65.0%	65.0%		35.0%	
Yellow Time (s)		4.5	4.5		3.6	
All-Red Time (s)		1.0	1.0		0.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.5	5.5		4.1	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		C-Max	C-Max		None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	

Splits and Phases: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

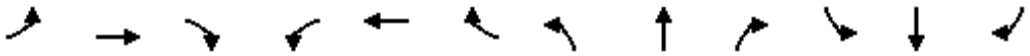




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	1548	890	0	462	464
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	0	1683	967	0	502	0
Adj No. of Lanes	0	3	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	0	3785	2634	0	612	281
Arrive On Green	0.00	1.00	0.73	0.00	0.17	0.00
Sat Flow, veh/h	0	5529	3800	0	3510	1615
Grp Volume(v), veh/h	0	1683	967	0	502	0
Grp Sat Flow(s),veh/h/ln	0	1729	1805	0	1755	1615
Q Serve(g_s), s	0.0	0.0	9.9	0.0	13.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	9.9	0.0	13.8	0.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	3785	2634	0	612	281
V/C Ratio(X)	0.00	0.44	0.37	0.00	0.82	0.00
Avail Cap(c_a), veh/h	0	3785	2634	0	1085	499
HCM Platoon Ratio	1.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.82	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	5.0	0.0	39.8	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.4	0.0	2.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.1	5.0	0.0	6.9	0.0
LnGrp Delay(d),s/veh	0.0	0.3	5.4	0.0	42.6	0.0
LnGrp LOS		A	A		D	
Approach Vol, veh/h		1683	967		502	
Approach Delay, s/veh		0.3	5.4		42.6	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		78.5		21.5		78.5		
Change Period (Y+Rc), s		5.5		4.1		5.5		
Max Green Setting (Gmax), s		59.5		30.9		59.5		
Max Q Clear Time (g_c+I1), s		2.0		15.8		11.9		
Green Ext Time (p_c), s		56.9		1.6		47.2		

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			
Volume (vph)	0	1713	17	0	890	510	0	0	35	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		100	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		213			1823			274			439	
Travel Time (s)		3.2			27.6			6.2			10.0	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1713	17	0	890	510	0	0	35	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	50	-	-	100	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1822	18	0	947	543	0	0	37	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	947	0	0	1822	0	0	2295	2769	911
Stage 1	-	-	-	-	-	-	1822	1822	-
Stage 2	-	-	-	-	-	-	473	947	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	733	-	-	341	-	0	34	20	281
Stage 1	-	-	-	-	-	0	117	130	-
Stage 2	-	-	-	-	-	0	599	342	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	733	-	-	341	-	-	34	0	281
Mov Cap-2 Maneuver	-	-	-	-	-	-	34	0	-
Stage 1	-	-	-	-	-	-	117	0	-
Stage 2	-	-	-	-	-	-	599	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	19.8
HCM LOS			C

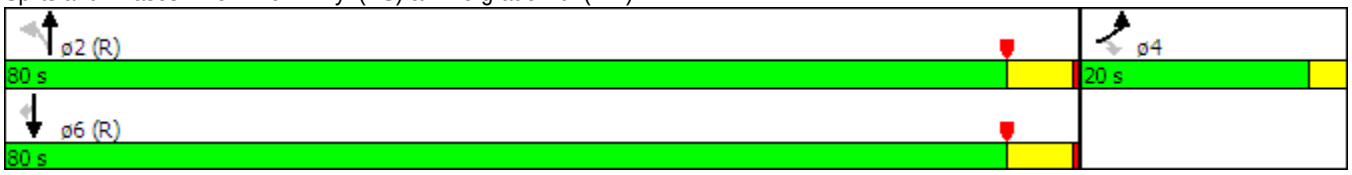
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT
Capacity (veh/h)	281	733	-	-	341	-
HCM Lane V/C Ratio	0.133	-	-	-	-	-
HCM Control Delay (s)	19.8	0	-	-	0	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	178	140	129	1195	1469	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	0	100			167
Storage Lanes	1	1	1			1
Taper Length (ft)	60		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	40			45	45	
Link Distance (ft)	894			350	1292	
Travel Time (s)	15.2			5.3	19.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	24.5	24.5
Total Split (s)	20.0	20.0	80.0	80.0	80.0	80.0
Total Split (%)	20.0%	20.0%	80.0%	80.0%	80.0%	80.0%
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 5 (5%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 5: Arrow Hwy. (NS) & Rivergrade Rd. (EW)





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	178	140	129	1195	1469	158
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	185	146	134	1245	1530	165
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	400	184	265	2892	2892	1294
Arrive On Green	0.11	0.11	1.00	1.00	0.80	0.80
Sat Flow, veh/h	3510	1615	294	3705	3705	1615
Grp Volume(v), veh/h	185	146	134	1245	1530	165
Grp Sat Flow(s),veh/h/ln	1755	1615	294	1805	1805	1615
Q Serve(g_s), s	4.9	8.8	19.2	0.0	14.6	2.3
Cycle Q Clear(g_c), s	4.9	8.8	33.9	0.0	14.6	2.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	400	184	265	2892	2892	1294
V/C Ratio(X)	0.46	0.79	0.51	0.43	0.53	0.13
Avail Cap(c_a), veh/h	597	275	265	2892	2892	1294
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.4	43.2	3.1	0.0	3.4	2.2
Incr Delay (d2), s/veh	0.8	9.0	6.8	0.5	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	2.4	4.4	2.0	0.2	7.3	1.1
LnGrp Delay(d),s/veh	42.3	52.1	9.9	0.5	4.1	2.4
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	331			1379	1695	
Approach Delay, s/veh	46.6			1.4	4.0	
Approach LOS	D			A	A	

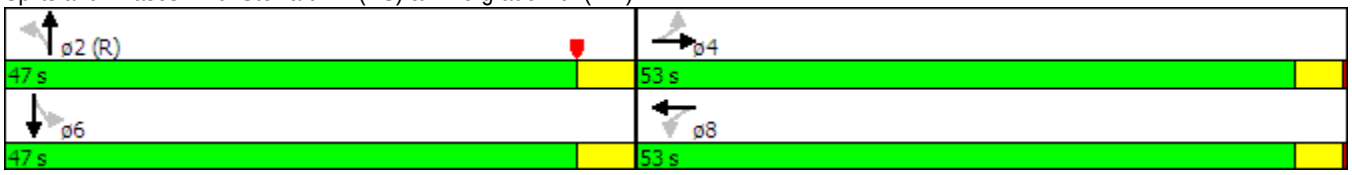
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		85.6		14.4		85.6		
Change Period (Y+Rc), s		5.5		3.0		5.5		
Max Green Setting (Gmax), s		74.5		17.0		74.5		
Max Q Clear Time (g_c+I1), s		35.9		10.8		16.6		
Green Ext Time (p_c), s		33.2		0.6		46.6		

Intersection Summary	
HCM 2010 Ctrl Delay	7.1
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	264	42	331	179	4	1	2	83	5	23	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	60		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40			30	
Link Distance (ft)		1564			894			486			206	
Travel Time (s)		26.7			15.2			8.3			4.7	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		19.5	19.5		19.5	19.5	
Total Split (s)	53.0	53.0		53.0	53.0		47.0	47.0		47.0	47.0	
Total Split (%)	53.0%	53.0%		53.0%	53.0%		47.0%	47.0%		47.0%	47.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: Stewart Av. (NS) & Rivergrade Rd. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	264	42	331	179	4	1	2	83	5	23	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	3	343	55	430	232	5	1	3	108	6	30	22
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	600	1530	243	499	1771	38	664	19	671	87	410	279
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	1161	3122	496	1002	3614	78	1374	44	1578	112	964	657
Grp Volume(v), veh/h	3	197	201	430	116	121	1	0	111	58	0	0
Grp Sat Flow(s),veh/h/ln	1161	1805	1812	1002	1805	1886	1374	0	1622	1733	0	0
Q Serve(g_s), s	0.1	6.2	6.4	42.6	3.5	3.5	0.0	0.0	4.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.6	6.2	6.4	49.0	3.5	3.5	0.0	0.0	4.2	1.9	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.04	1.00		0.97	0.10		0.38
Lane Grp Cap(c), veh/h	600	884	888	499	884	924	664	0	689	776	0	0
V/C Ratio(X)	0.00	0.22	0.23	0.86	0.13	0.13	0.00	0.00	0.16	0.07	0.00	0.00
Avail Cap(c_a), veh/h	600	884	888	499	884	924	664	0	689	776	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.95	0.95	0.95	0.87	0.00	0.87	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.9	14.6	14.6	28.8	13.9	13.9	16.5	0.0	17.7	17.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	13.6	0.1	0.1	0.0	0.0	0.4	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	3.1	3.2	13.7	1.8	1.8	0.0	0.0	2.0	1.0	0.0	0.0
LnGrp Delay(d),s/veh	14.9	14.7	14.7	42.5	14.0	14.0	16.5	0.0	18.2	17.3	0.0	0.0
LnGrp LOS	B	B	B	D	B	B	B		B	B		
Approach Vol, veh/h		401			667			112			58	
Approach Delay, s/veh		14.7			32.3			18.2			17.3	
Approach LOS		B			C			B			B	

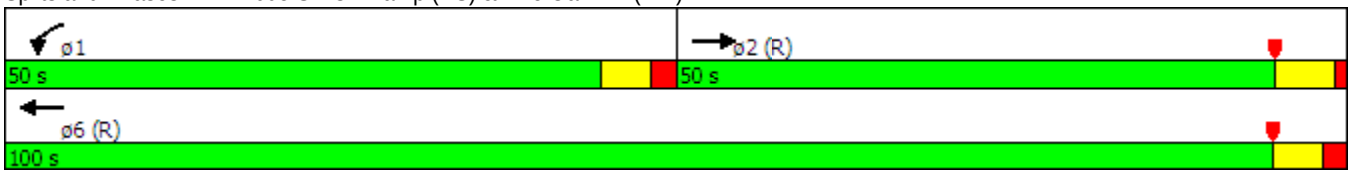
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		47.0		53.0		47.0		53.0
Change Period (Y+Rc), s		4.5		4.0		4.5		4.0
Max Green Setting (Gmax), s		42.5		49.0		42.5		49.0
Max Q Clear Time (g_c+I1), s		6.2		8.4		3.9		51.0
Green Ext Time (p_c), s		0.6		6.8		0.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1448	1257	754	1651	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	360		0	0
Storage Lanes		1	1		0	0
Taper Length (ft)			25		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	2305			355	524	
Travel Time (s)	34.9			5.4	11.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	10.0		20.0	20.0		
Minimum Split (s)	23.5		25.6	25.6		
Total Split (s)	50.0		50.0	100.0		
Total Split (%)	50.0%		50.0%	100.0%		
Yellow Time (s)	4.5		3.6	3.6		
All-Red Time (s)	1.0		2.0	2.0		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	5.5		5.6	5.6		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		Max	C-Max		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)



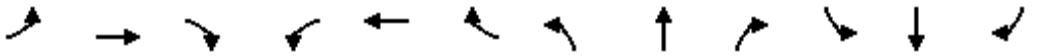
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1448	1257	754	1651	0	0
Number	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900		
Adj Flow Rate, veh/h	1574	0	820	1795		
Adj No. of Lanes	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	0	0	0	0		
Cap, veh/h	1726	772	803	3531		
Arrive On Green	0.48	0.00	0.89	1.00		
Sat Flow, veh/h	3705	1615	1810	3705		
Grp Volume(v), veh/h	1574	0	820	1795		
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805		
Q Serve(g_s), s	40.4	0.0	44.4	0.0		
Cycle Q Clear(g_c), s	40.4	0.0	44.4	0.0		
Prop In Lane		1.00	1.00			
Lane Grp Cap(c), veh/h	1726	772	803	3531		
V/C Ratio(X)	0.91	0.00	1.02	0.51		
Avail Cap(c_a), veh/h	1726	772	803	3531		
HCM Platoon Ratio	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	24.2	0.0	5.6	0.0		
Incr Delay (d2), s/veh	8.8	0.0	37.1	0.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	22.0	0.0	27.0	0.3		
LnGrp Delay(d),s/veh	33.0	0.0	42.7	0.5		
LnGrp LOS	C		F	A		
Approach Vol, veh/h	1574			2615		
Approach Delay, s/veh	33.0			13.7		
Approach LOS	C			B		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		
Phs Duration (G+Y+Rc), s	50.0	53.5				103.5		
Change Period (Y+Rc), s	5.6	* 5.6				5.6		
Max Green Setting (Gmax), s	44.4	* 45				94.4		
Max Q Clear Time (g_c+I1), s	46.4	42.4				2.0		
Green Ext Time (p_c), s	0.0	2.1				87.4		

Intersection Summary	
HCM 2010 Ctrl Delay	21.0
HCM 2010 LOS	C

Notes

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↱			↱
Volume (vph)	0	1448	0	0	1515	0	0	0	762	0	0	889
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	245.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1448	0	0	1515	0	0	0	762	0	0	889
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1493	0	0	1562	0	0	0	786	0	0	916

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1562	0	0	1493	0	0	2274	3055	746	2308	3055	781
Stage 1	-	-	-	-	-	-	1493	1493	-	1562	1562	-
Stage 2	-	-	-	-	-	-	781	1562	-	746	1493	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	429	-	-	456	-	-	22	13	~ 360	21	13	~ 342
Stage 1	-	-	-	-	-	-	132	188	-	119	174	-
Stage 2	-	-	-	-	-	-	358	174	-	376	188	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	429	-	-	456	-	-	-	13	~ 360	-	13	~ 342
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	13	-	-	13	-
Stage 1	-	-	-	-	-	-	132	188	-	119	174	-
Stage 2	-	-	-	-	-	-	-	174	-	-	188	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	$ 564.8	$ 787.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	360	429	-	-	456	-	-	342
HCM Lane V/C Ratio	2.182	-	-	-	-	-	-	2.68
HCM Control Delay (s)	$ 564.8	0	-	-	0	-	-	$ 787.9
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	58.3	0	-	-	0	-	-	76.3

Notes

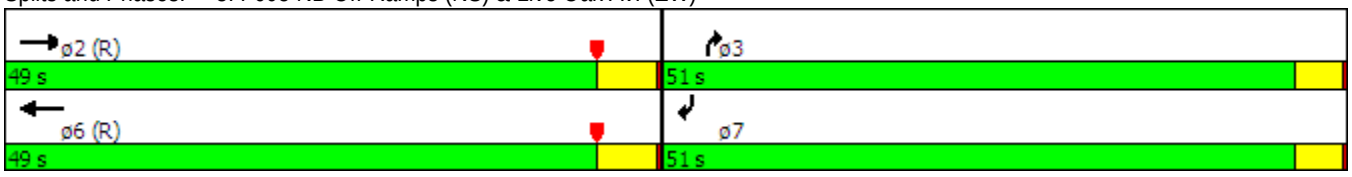
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1448	0	0	1515	0	0	0	762	0	0	889
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		355			205			501			451	
Travel Time (s)		5.4			3.1			11.4			10.3	
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
Shared Lane Traffic (%)												
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Detector Phase		2			6				3			7
Switch Phase												
Minimum Initial (s)		10.0			10.0				4.0			4.0
Minimum Split (s)		21.0			21.0				8.0			8.0
Total Split (s)		49.0			49.0				51.0			51.0
Total Split (%)		49.0%			49.0%				51.0%			51.0%
Yellow Time (s)		4.5			4.5				3.5			3.5
All-Red Time (s)		0.5			0.5				0.5			0.5
Lost Time Adjust (s)		0.0			0.0				0.0			0.0
Total Lost Time (s)		5.0			5.0				4.0			4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max			C-Max				None			None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1448	0	0	1515	0	0	0	762	0	0	889
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	0	0	1900	0	0	0	1900	0	0	1900
Adj Flow Rate, veh/h	0	1493	0	0	1562	0	0	0	786	0	0	916
Adj No. of Lanes	0	2	0	0	2	0	0	0	2	0	0	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	3430	0	0	3430	0	0	0	0	0	0	0
Arrive On Green	0.00	0.31	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	3800	0	0	3800	0		0			0	
Grp Volume(v), veh/h	0	1493	0	0	1562	0		0.0			0.0	
Grp Sat Flow(s),veh/h/ln	0	1805	0	0	1805	0						
Q Serve(g_s), s	0.0	32.9	0.0	0.0	0.0	0.0						
Cycle Q Clear(g_c), s	0.0	32.9	0.0	0.0	0.0	0.0						
Prop In Lane	0.00		0.00	0.00		0.00						
Lane Grp Cap(c), veh/h	0	3430	0	0	3430	0						
V/C Ratio(X)	0.00	0.44	0.00	0.00	0.46	0.00						
Avail Cap(c_a), veh/h	0	3430	0	0	3430	0						
HCM Platoon Ratio	1.00	0.33	1.00	1.00	1.33	1.00						
Upstream Filter(I)	0.00	0.14	0.00	0.00	0.86	0.00						
Uniform Delay (d), s/veh	0.0	13.0	0.0	0.0	0.0	0.0						
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.4	0.0						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(-26165%),veh/ln	0.0	16.5	0.0	0.0	0.2	0.0						
LnGrp Delay(d),s/veh	0.0	13.1	0.0	0.0	0.4	0.0						
LnGrp LOS		B			A							
Approach Vol, veh/h		1493			1562							
Approach Delay, s/veh		13.1			0.4							
Approach LOS		B			A							

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		
Phs Duration (G+Y+Rc), s		100.0				100.0		
Change Period (Y+Rc), s		5.0				5.0		
Max Green Setting (Gmax), s		44.0				44.0		
Max Q Clear Time (g_c+I1), s		34.9				2.0		
Green Ext Time (p_c), s		9.0				39.9		

Intersection Summary	
HCM 2010 Ctrl Delay	6.6
HCM 2010 LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2160	49	36	1496	19	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	220		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	205			600	457	
Travel Time (s)	3.1			9.1	10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	10.0	10.0	4.0	10.0	4.0	
Minimum Split (s)	22.0	22.0	8.0	20.0	26.0	
Total Split (s)	66.0	66.0	8.0	74.0	26.0	
Total Split (%)	66.0%	66.0%	8.0%	74.0%	26.0%	
Yellow Time (s)	4.5	4.5	3.0	4.5	3.0	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	3.0	4.5	3.0	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 9: Graham Rd. (NS) & Live Oak Av. (EW)



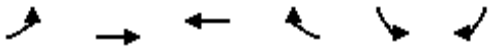
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2160	49	36	1496	19	23
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2348	53	39	1626	21	25
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	3005	1344	50	3212	27	32
Arrive On Green	1.00	1.00	0.04	1.00	0.04	0.04
Sat Flow, veh/h	3705	1615	1810	3705	761	905
Grp Volume(v), veh/h	2348	53	39	1626	47	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1810	1805	1702	0
Q Serve(g_s), s	0.0	0.0	2.1	0.0	2.7	0.0
Cycle Q Clear(g_c), s	0.0	0.0	2.1	0.0	2.7	0.0
Prop In Lane		1.00	1.00		0.45	0.53
Lane Grp Cap(c), veh/h	3005	1344	50	3212	60	0
V/C Ratio(X)	0.78	0.04	0.79	0.51	0.79	0.00
Avail Cap(c_a), veh/h	3005	1344	90	3212	392	0
HCM Platoon Ratio	2.00	2.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	47.9	0.0	47.9	0.0
Incr Delay (d2), s/veh	2.1	0.1	9.8	0.6	19.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.9	0.0	1.2	0.3	1.6	0.0
LnGrp Delay(d),s/veh	2.1	0.1	57.7	0.6	67.7	0.0
LnGrp LOS	A	A	E	A	E	
Approach Vol, veh/h	2401			1665	47	
Approach Delay, s/veh	2.0			1.9	67.7	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.7	87.8				93.5		6.5
Change Period (Y+Rc), s	3.0	4.5				4.5		3.0
Max Green Setting (Gmax), s	5.0	61.5				69.5		23.0
Max Q Clear Time (g_c+I1), s	4.1	2.0				2.0		4.7
Green Ext Time (p_c), s	0.0	58.3				66.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	2.7
HCM 2010 LOS	A

Notes

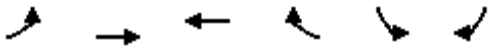
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	50	2113	1444	7	12	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	286			50	0	100
Storage Lanes	1			1	1	0
Taper Length (ft)	60				25	
Link Speed (mph)		45	45		30	
Link Distance (ft)		645	768		377	
Travel Time (s)		9.8	11.6		8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	50	2113	1444	7	12	76
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	53	2224	1520	7	13	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		645	768			
pX, platoon unblocked	0.70				0.47	0.70
vC, conflicting volume	1527				2737	760
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	911				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				97	90
cM capacity (veh/h)	533				438	769

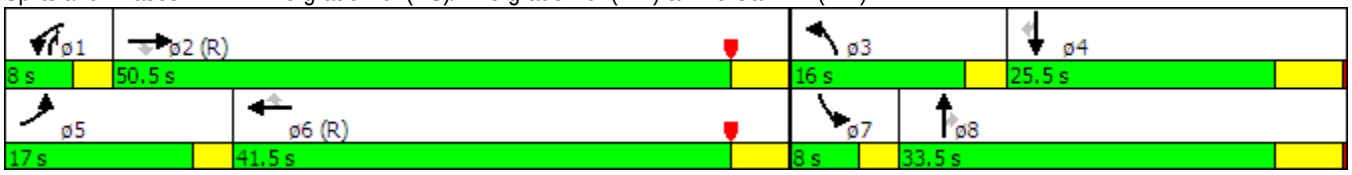
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	53	1112	1112	760	760	7	93
Volume Left	53	0	0	0	0	0	13
Volume Right	0	0	0	0	0	7	80
cSH	533	1700	1700	1700	1700	1700	697
Volume to Capacity	0.10	0.65	0.65	0.45	0.45	0.00	0.13
Queue Length 95th (ft)	8	0	0	0	0	0	11
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	0.0	11.0
Lane LOS	B						B
Approach Delay (s)	0.3			0.0			11.0
Approach LOS							B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	198	1900	35	93	1173	7	117	73	402	29	24	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		25	165		180	315		0	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	60			60			60			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		768			1387			794			1564	
Travel Time (s)		11.6			21.0			13.5			26.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	25.0	25.0	8.0	34.0	34.0	8.0	33.5	8.0	8.0	24.5	24.5
Total Split (s)	17.0	50.5	50.5	8.0	41.5	41.5	16.0	33.5	8.0	8.0	25.5	25.5
Total Split (%)	17.0%	50.5%	50.5%	8.0%	41.5%	41.5%	16.0%	33.5%	8.0%	8.0%	25.5%	25.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 29 (29%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	

Splits and Phases: 11: Rivergrade Rd. (NS)/Rivergrade Rd. (EW) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	198	1900	35	93	1173	7	117	73	402	29	24	163
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	208	2000	0	98	1235	7	123	77	423	31	25	172
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	238	1801	805	90	1505	673	152	509	514	42	748	335
Arrive On Green	0.18	0.66	0.00	0.10	0.83	0.83	0.08	0.27	0.27	0.01	0.07	0.07
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1615	1810	3610	1615
Grp Volume(v), veh/h	208	2000	0	98	1235	7	123	77	423	31	25	172
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1615	1810	1805	1615
Q Serve(g_s), s	11.2	49.9	0.0	5.0	18.0	0.1	6.7	3.1	24.2	1.7	0.6	10.3
Cycle Q Clear(g_c), s	11.2	49.9	0.0	5.0	18.0	0.1	6.7	3.1	24.2	1.7	0.6	10.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	238	1801	805	90	1505	673	152	509	514	42	748	335
V/C Ratio(X)	0.87	1.11	0.00	1.08	0.82	0.01	0.81	0.15	0.82	0.74	0.03	0.51
Avail Cap(c_a), veh/h	253	1801	805	90	1505	673	235	532	533	90	748	335
HCM Platoon Ratio	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	16.8	0.0	45.0	6.3	4.8	45.0	27.9	31.5	49.3	37.2	41.7
Incr Delay (d2), s/veh	24.3	58.4	0.0	110.8	4.3	0.0	5.7	0.2	10.7	9.1	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	7.2	38.9	0.0	5.2	9.1	0.0	3.6	1.7	12.2	1.0	0.3	4.8
LnGrp Delay(d),s/veh	64.7	75.2	0.0	156.1	10.7	4.9	50.7	28.1	42.1	58.5	37.3	43.9
LnGrp LOS	E	F		F	B	A	D	C	D	E	D	D
Approach Vol, veh/h		2208			1340			623			228	
Approach Delay, s/veh		74.3			21.3			42.1			45.2	
Approach LOS		E			C			D			D	

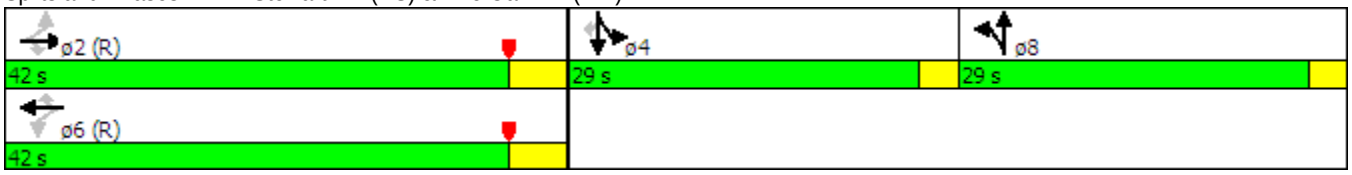
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	54.4	11.4	26.2	16.2	46.2	5.3	32.3
Change Period (Y+Rc), s	3.0	4.5	3.0	5.5	3.0	4.5	3.0	5.5
Max Green Setting (Gmax), s	5.0	46.0	13.0	20.0	14.0	37.0	5.0	28.0
Max Q Clear Time (g_c+I1), s	7.0	51.9	8.7	12.3	13.2	20.0	3.7	26.2
Green Ext Time (p_c), s	0.0	0.0	0.0	2.9	0.0	16.6	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	52.1
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	2179	305	45	1148	7	85	25	15	25	113	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	163		0	100		50	42		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	60			60			25			60		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1387			1141			1039			486	
Travel Time (s)		21.0			17.3			17.7			8.3	
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
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Detector Phase	2	2	2	6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	29.0	29.0		29.0	29.0	29.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	29.0	29.0		29.0	29.0	29.0
Total Split (%)	42.0%	42.0%	42.0%	42.0%	42.0%	42.0%	29.0%	29.0%		29.0%	29.0%	29.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 19 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 12: Stewart Av. (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	64	2179	305	45	1148	7	85	25	15	25	113	14
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	70	2368	332	49	1248	8	92	27	16	27	123	15
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	1	1	1
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	391	2565	1147	150	2565	1147	118	35	21	160	168	142
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.10	0.10	0.10	0.09	0.09	0.09
Sat Flow, veh/h	449	3610	1615	109	3610	1615	1227	360	213	1810	1900	1615
Grp Volume(v), veh/h	70	2368	332	49	1248	8	135	0	0	27	123	15
Grp Sat Flow(s),veh/h/ln	449	1805	1615	109	1805	1615	1801	0	0	1810	1900	1615
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	1.4	6.3	0.9
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	1.4	6.3	0.9
Prop In Lane	1.00		1.00	1.00		1.00	0.68		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	391	2565	1147	150	2565	1147	173	0	0	160	168	142
V/C Ratio(X)	0.18	0.92	0.29	0.33	0.49	0.01	0.78	0.00	0.00	0.17	0.73	0.11
Avail Cap(c_a), veh/h	391	2565	1147	150	2565	1147	468	0	0	470	494	420
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.15	0.15	0.15	0.70	0.70	0.70	1.00	0.00	0.00	0.38	0.38	0.38
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	44.1	0.0	0.0	42.2	44.4	42.0
Incr Delay (d2), s/veh	0.2	1.2	0.1	4.1	0.5	0.0	7.3	0.0	0.0	0.2	2.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.4	0.0	0.2	0.2	0.0	4.0	0.0	0.0	0.7	3.4	0.4
LnGrp Delay(d),s/veh	0.2	1.2	0.1	4.1	0.5	0.0	51.5	0.0	0.0	42.4	46.8	42.1
LnGrp LOS	A	A	A	A	A	A	D			D	D	D
Approach Vol, veh/h		2770			1305			135			165	
Approach Delay, s/veh		1.1			0.6			51.5			45.7	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		75.5		11.8		75.5		12.6
Change Period (Y+Rc), s		4.5		3.0		4.5		3.0
Max Green Setting (Gmax), s		37.5		26.0		37.5		26.0
Max Q Clear Time (g_c+I1), s		2.0		8.3		2.0		9.3
Green Ext Time (p_c), s		31.6		0.6		31.6		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	4.2
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1496	581	293	1214	23	107	5	96	23	7	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		50	200		0	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	60			60			60			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1141			511			1039			220	
Travel Time (s)		17.3			7.7			23.6			5.0	
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
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Detector Phase	5	2	2	1	6	6	3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	10.0	10.0		4.0	4.0	
Minimum Split (s)	8.0	20.5	20.5	8.0	20.0	20.0	20.5	20.5		8.0	20.0	
Total Split (s)	8.0	42.5	42.5	17.0	51.5	51.5	20.5	31.5		9.0	20.0	
Total Split (%)	8.0%	42.5%	42.5%	17.0%	51.5%	51.5%	20.5%	31.5%		9.0%	20.0%	
Yellow Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5		3.5	3.5	
All-Red Time (s)	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 13: Baldwin Park Blvd. / Dwy. 3 (NS) & Live Oak Av. (EW)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	1496	581	293	1214	23	107	5	96	23	7	36
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	25	1626	632	318	1320	25	116	5	104	25	8	39
Adj No. of Lanes	1	2	1	1	2	1	2	1	0	1	1	0
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
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	36	1480	662	235	1877	840	562	20	419	36	35	172
Arrive On Green	0.03	0.55	0.55	0.26	1.00	1.00	0.16	0.27	0.27	0.02	0.13	0.13
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	3510	75	1552	1810	282	1375
Grp Volume(v), veh/h	25	1626	632	318	1320	25	116	0	109	25	0	47
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1755	0	1626	1810	0	1657
Q Serve(g_s), s	1.4	41.0	37.1	13.0	0.0	0.0	2.9	0.0	5.2	1.4	0.0	2.6
Cycle Q Clear(g_c), s	1.4	41.0	37.1	13.0	0.0	0.0	2.9	0.0	5.2	1.4	0.0	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.83
Lane Grp Cap(c), veh/h	36	1480	662	235	1877	840	562	0	439	36	0	207
V/C Ratio(X)	0.69	1.10	0.95	1.35	0.70	0.03	0.21	0.00	0.25	0.69	0.00	0.23
Avail Cap(c_a), veh/h	72	1480	662	235	1877	840	562	0	439	90	0	265
HCM Platoon Ratio	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.10	0.10	0.10	0.69	0.69	0.69	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.4	22.7	21.9	37.0	0.0	0.0	36.5	0.0	28.6	48.7	0.0	39.4
Incr Delay (d2), s/veh	2.4	45.7	4.7	176.5	1.6	0.0	0.8	0.0	1.3	20.8	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	29.4	17.2	17.9	0.4	0.0	1.5	0.0	2.5	0.9	0.0	1.2
LnGrp Delay(d),s/veh	50.7	68.5	26.5	213.5	1.6	0.0	37.3	0.0	29.9	69.5	0.0	39.9
LnGrp LOS	D	F	C	F	A	A	D		C	E		D
Approach Vol, veh/h		2283			1663			225			72	
Approach Delay, s/veh		56.7			42.1			33.7			50.2	
Approach LOS		E			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	45.5	20.5	17.0	6.0	56.5	6.0	31.5
Change Period (Y+Rc), s	4.0	4.5	4.5	* 4.5	4.0	4.5	4.0	4.5
Max Green Setting (Gmax), s	13.0	38.0	16.0	* 16	4.0	47.0	5.0	27.0
Max Q Clear Time (g_c+I1), s	15.0	43.0	4.9	4.6	3.4	2.0	3.4	7.2
Green Ext Time (p_c), s	0.0	0.0	0.4	0.8	0.0	43.7	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	49.6
HCM 2010 LOS	D

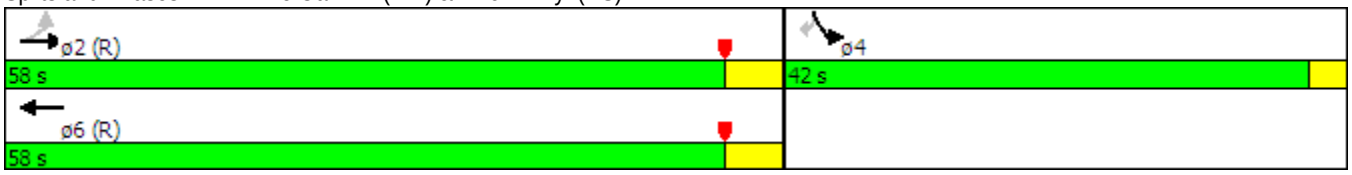
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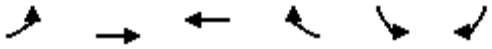
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	59	1553	1364	0	1198	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	175
Storage Lanes	1			0	2	0
Taper Length (ft)	60				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		45	45		45	
Link Distance (ft)		511	450		278	
Travel Time (s)		7.7	6.8		4.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		4.0	4.0
Minimum Split (s)	20.0	20.0	28.5		27.0	27.0
Total Split (s)	58.0	58.0	58.0		42.0	42.0
Total Split (%)	58.0%	58.0%	58.0%		42.0%	42.0%
Yellow Time (s)	4.5	4.5	4.5		3.0	3.0
All-Red Time (s)	0.0	0.0	0.0		0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max		None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 21 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 14: Live Oak Av. (EW) & Arrow Hwy. (NS)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	59	1553	1364	0	1198	167
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	61	1601	1406	0	1235	172
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	173	1980	1980	0	1322	608
Arrive On Green	1.00	1.00	0.55	0.00	0.38	0.38
Sat Flow, veh/h	389	3705	3800	0	3510	1615
Grp Volume(v), veh/h	61	1601	1406	0	1235	172
Grp Sat Flow(s),veh/h/ln	389	1805	1805	0	1755	1615
Q Serve(g_s), s	11.5	0.0	28.8	0.0	33.8	7.4
Cycle Q Clear(g_c), s	40.3	0.0	28.8	0.0	33.8	7.4
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	173	1980	1980	0	1322	608
V/C Ratio(X)	0.35	0.81	0.71	0.00	0.93	0.28
Avail Cap(c_a), veh/h	173	1980	1980	0	1369	630
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	10.6	0.0	16.7	0.0	30.0	21.8
Incr Delay (d2), s/veh	0.5	0.3	2.2	0.0	11.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.3	0.1	14.9	0.0	18.5	3.3
LnGrp Delay(d),s/veh	11.1	0.3	18.9	0.0	41.7	22.0
LnGrp LOS	B	A	B		D	C
Approach Vol, veh/h		1662	1406		1407	
Approach Delay, s/veh		0.7	18.9		39.3	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		59.3		40.7		59.3		
Change Period (Y+Rc), s		4.5		3.0		4.5		
Max Green Setting (Gmax), s		53.5		39.0		53.5		
Max Q Clear Time (g_c+I1), s		42.3		35.8		30.8		
Green Ext Time (p_c), s		11.0		1.8		22.1		

Intersection Summary	
HCM 2010 Ctrl Delay	18.6
HCM 2010 LOS	B

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2184	555	70	2112	290	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		50	80		0	50
Storage Lanes		1	1		2	1
Taper Length (ft)			60		25	
Right Turn on Red		Yes				Yes
Link Speed (mph)	45			45	30	
Link Distance (ft)	185			1213	1061	
Travel Time (s)	2.8			18.4	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	20.0	20.0
Total Split (s)	80.0	80.0	80.0	80.0	20.0	20.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 15: Maine Av. (NS) & Live Oak Av. (EW)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2184	555	70	2112	290	109
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2374	603	76	2296	315	118
Adj No. of Lanes	2	1	1	3	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2708	1211	94	3890	562	258
Arrive On Green	0.75	0.75	0.75	0.75	0.16	0.16
Sat Flow, veh/h	3705	1615	82	5358	3510	1615
Grp Volume(v), veh/h	2374	603	76	2296	315	118
Grp Sat Flow(s),veh/h/ln	1805	1615	82	1729	1755	1615
Q Serve(g_s), s	48.0	14.9	27.0	19.9	8.3	6.6
Cycle Q Clear(g_c), s	48.0	14.9	75.0	19.9	8.3	6.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2708	1211	94	3890	562	258
V/C Ratio(X)	0.88	0.50	0.81	0.59	0.56	0.46
Avail Cap(c_a), veh/h	2708	1211	94	3890	562	258
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.1	5.0	46.0	5.6	38.8	38.1
Incr Delay (d2), s/veh	4.4	1.5	50.4	0.7	4.0	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	25.1	7.0	3.4	9.6	4.3	3.4
LnGrp Delay(d),s/veh	13.5	6.5	96.4	6.3	42.8	43.8
LnGrp LOS	B	A	F	A	D	D
Approach Vol, veh/h	2977			2372	433	
Approach Delay, s/veh	12.1			9.2	43.0	
Approach LOS	B			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		80.0				80.0		20.0
Change Period (Y+Rc), s		5.0				5.0		4.0
Max Green Setting (Gmax), s		75.0				75.0		16.0
Max Q Clear Time (g_c+I1), s		50.0				77.0		10.3
Green Ext Time (p_c), s		24.9				0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	235	13	15	1087	1352	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			100
Storage Lanes	1	1	1			0
Taper Length (ft)	25		60			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			45	45	
Link Distance (ft)	296			257	167	
Travel Time (s)	6.7			3.9	2.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	29.0	29.0	8.0	71.0	63.0	63.0
Total Split (%)	29.0%	29.0%	8.0%	71.0%	63.0%	63.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

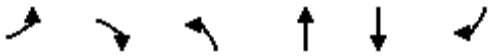
Splits and Phases: 16: Arrow Hwy. (NS) & Driveway 1 (EW)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	235	13	15	1087	1352	219
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	247	14	16	1144	1423	231
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	286	256	26	2750	2554	1142
Arrive On Green	0.16	0.16	0.01	0.76	1.00	1.00
Sat Flow, veh/h	1810	1615	1810	3705	3705	1615
Grp Volume(v), veh/h	247	14	16	1144	1423	231
Grp Sat Flow(s),veh/h/ln	1810	1615	1810	1805	1805	1615
Q Serve(g_s), s	13.3	0.7	0.9	11.1	0.0	0.0
Cycle Q Clear(g_c), s	13.3	0.7	0.9	11.1	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	286	256	26	2750	2554	1142
V/C Ratio(X)	0.86	0.05	0.62	0.42	0.56	0.20
Avail Cap(c_a), veh/h	452	404	72	2750	2554	1142
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	35.7	49.0	4.2	0.0	0.0
Incr Delay (d2), s/veh	9.8	0.1	21.4	0.5	0.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	7.4	0.7	0.6	5.6	0.3	0.1
LnGrp Delay(d),s/veh	50.8	35.8	70.4	4.6	0.9	0.4
LnGrp LOS	D	D	E	A	A	A
Approach Vol, veh/h	261			1160	1654	
Approach Delay, s/veh	50.0			5.5	0.8	
Approach LOS	D			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		80.2		19.8	5.4	74.7		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		67.0		25.0	4.0	59.0		
Max Q Clear Time (g_c+I1), s		13.1		15.3	2.9	2.0		
Green Ext Time (p_c), s		35.1		0.5	0.0	36.3		

Intersection Summary	
HCM 2010 Ctrl Delay	6.8
HCM 2010 LOS	A



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	6	2	4	1318	1569	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Link Speed (mph)	30			45	45	
Link Distance (ft)	301			157	350	
Travel Time (s)	6.8			2.4	5.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	6	2	4	1318	1569	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	2	4	1387	1652	42

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2354	826	1652	0	-	0
Stage 1	1652	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	31	319	396	-	-	-
Stage 1	144	-	-	-	-	-
Stage 2	458	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	30	319	396	-	-	-
Mov Cap-2 Maneuver	109	-	-	-	-	-
Stage 1	144	-	-	-	-	-
Stage 2	438	-	-	-	-	-

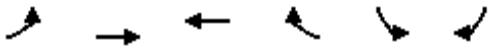
Approach	EB	NB	SB
HCM Control Delay, s	34.6	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	396	-	130	-	-
HCM Lane V/C Ratio	0.011	-	0.065	-	-
HCM Control Delay (s)	14.2	0.3	34.6	-	-
HCM Lane LOS	B	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

VOLUME-TO-CAPACITY RATIO

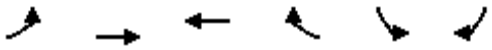
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	642	0	270	1858	1024	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	698	0	293	2020	1113	292
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	698	0	293	2020	1113	292
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	42.7		12.3	59.0	33.0	100.0
Effective Green, g (s)	42.7		12.3	59.0	33.0	100.0
Actuated g/C Ratio	0.43		0.12	0.59	0.33	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1541		430	2129	1155	1615
v/s Ratio Prot	0.19		0.08	c0.56	c0.32	
v/s Ratio Perm						0.18
v/c Ratio	0.45		0.68	0.95	0.96	0.18
Uniform Delay, d1	20.4		42.0	19.1	32.9	0.0
Progression Factor	1.00		1.28	1.01	0.95	1.00
Incremental Delay, d2	1.0		0.3	1.3	16.8	0.2
Delay (s)	21.3		54.0	20.6	48.1	0.2
Level of Service	C		D	C	D	A
Approach Delay (s)	21.3			24.8	38.2	
Approach LOS	C			C	D	

Intersection Summary			
Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



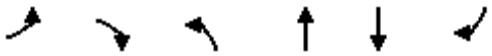
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	319	578	2037	716	204	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	347	628	2214	778	222	147
RTOR Reduction (vph)	0	0	0	265	0	130
Lane Group Flow (vph)	347	628	2214	513	222	17
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	27.3	77.8	47.5	47.5	11.7	11.7
Effective Green, g (s)	27.3	77.8	47.5	47.5	11.7	11.7
Actuated g/C Ratio	0.27	0.78	0.48	0.48	0.12	0.12
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	492	2808	1714	767	409	188
v/s Ratio Prot	c0.19	0.17	c0.61		c0.06	
v/s Ratio Perm				0.32		0.01
v/c Ratio	0.71	0.22	1.29	0.67	0.54	0.09
Uniform Delay, d1	32.7	3.0	26.2	20.2	41.6	39.4
Progression Factor	0.53	2.35	0.96	1.28	1.00	1.00
Incremental Delay, d2	3.5	0.2	133.3	2.1	1.5	0.2
Delay (s)	21.0	7.2	158.6	27.9	43.1	39.6
Level of Service	C	A	F	C	D	D
Approach Delay (s)		12.1	124.6		41.7	
Approach LOS		B	F		D	

Intersection Summary			
Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	772	2051	0	584	697
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	821	2182	0	621	741
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	821	2182	0	621	741
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		57.5	57.5		32.9	100.0
Effective Green, g (s)		57.5	57.5		32.9	100.0
Actuated g/C Ratio		0.58	0.58		0.33	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2982	2075		593	1615
v/s Ratio Prot		0.16	c0.60		c0.34	
v/s Ratio Perm						0.46
v/c Ratio		0.28	1.05		1.05	0.46
Uniform Delay, d1		10.7	21.2		33.5	0.0
Progression Factor		1.71	1.09		1.00	1.00
Incremental Delay, d2		0.2	30.2		49.9	0.9
Delay (s)		18.5	53.5		83.5	0.9
Level of Service		B	D		F	A
Approach Delay (s)		18.5	53.5		38.6	
Approach LOS		B	D		D	

Intersection Summary			
Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	258	113	133	2335	713	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.35	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	673	3610	3610	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	280	123	145	2538	775	360
RTOR Reduction (vph)	0	107	0	0	0	78
Lane Group Flow (vph)	280	16	145	2538	775	282
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	13.2	13.2	78.3	78.3	78.3	78.3
Effective Green, g (s)	13.2	13.2	78.3	78.3	78.3	78.3
Actuated g/C Ratio	0.13	0.13	0.78	0.78	0.78	0.78
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	462	213	526	2826	2826	1264
v/s Ratio Prot	c0.08			c0.70	0.21	
v/s Ratio Perm		0.01	0.22			0.17
v/c Ratio	0.61	0.08	0.28	0.90	0.27	0.22
Uniform Delay, d1	40.9	38.1	3.0	7.9	3.0	2.9
Progression Factor	1.05	1.08	0.59	0.43	1.84	7.30
Incremental Delay, d2	2.2	0.2	0.7	2.8	0.2	0.4
Delay (s)	45.3	41.2	2.5	6.2	5.7	21.2
Level of Service	D	D	A	A	A	C
Approach Delay (s)	44.1			6.0	10.6	
Approach LOS	D			A	B	

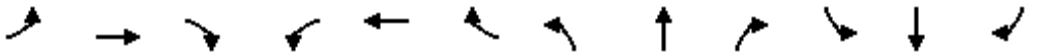
Intersection Summary			
Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	223	11	105	397	13	11	10	100	9	7	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3585		1805	3592		1805	1640			1750	
Flt Permitted	0.27	1.00		0.51	1.00		0.73	1.00			0.95	
Satd. Flow (perm)	517	3585		963	3592		1395	1640			1681	
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)	28	251	12	118	446	15	12	11	112	10	8	17
RTOR Reduction (vph)	0	6	0	0	4	0	0	31	0	0	5	0
Lane Group Flow (vph)	28	257	0	118	457	0	12	92	0	0	30	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)	19.4	19.4		19.4	19.4		72.1	72.1			72.1	
Effective Green, g (s)	19.4	19.4		19.4	19.4		72.1	72.1			72.1	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.72	0.72			0.72	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	100	695		186	696		1005	1182			1212	
v/s Ratio Prot		0.07			c0.13			c0.06				
v/s Ratio Perm	0.05			0.12			0.01				0.02	
v/c Ratio	0.28	0.37		0.63	0.66		0.01	0.08			0.02	
Uniform Delay, d1	34.3	35.0		37.0	37.2		3.9	4.1			4.0	
Progression Factor	0.66	0.68		0.88	0.87		0.41	0.33			1.00	
Incremental Delay, d2	1.4	0.3		6.8	2.2		0.0	0.1			0.0	
Delay (s)	24.1	24.2		39.4	34.7		1.6	1.5			4.0	
Level of Service	C	C		D	C		A	A			A	
Approach Delay (s)		24.2			35.7			1.5			4.0	
Approach LOS		C			D			A			A	

Intersection Summary			
Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	362	727	872	1669	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	385	773	928	1776	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	385	773	928	1776	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	19.5	100.0	69.4	100.0		
Effective Green, g (s)	19.5	100.0	69.4	100.0		
Actuated g/C Ratio	0.20	1.00	0.69	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	703	1615	1252	3610		
v/s Ratio Prot	0.11		c0.51	c0.49		
v/s Ratio Perm		0.48				
v/c Ratio	0.55	0.48	0.74	0.49		
Uniform Delay, d1	36.3	0.0	9.6	0.0		
Progression Factor	0.75	1.00	0.67	1.00		
Incremental Delay, d2	3.0	1.0	3.7	0.4		
Delay (s)	30.2	1.0	10.1	0.4		
Level of Service	C	A	B	A		
Approach Delay (s)	10.7			3.8	0.0	
Approach LOS	B			A	A	

Intersection Summary			
Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	362	0	0	1745	0	0	0	853	0	0	796
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0				4.0			4.0
Lane Util. Factor		0.95			0.91				0.88			1.00
Frt		1.00			1.00				0.85			0.86
Flt Protected		1.00			1.00				1.00			1.00
Satd. Flow (prot)		3610			5187				2842			1644
Flt Permitted		1.00			1.00				1.00			1.00
Satd. Flow (perm)		3610			5187				2842			1644
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	373	0	0	1799	0	0	0	879	0	0	821
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	259	0	0	11
Lane Group Flow (vph)	0	373	0	0	1799	0	0	0	620	0	0	810
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Actuated Green, G (s)		39.3			39.3				51.7			51.7
Effective Green, g (s)		39.3			39.3				51.7			51.7
Actuated g/C Ratio		0.39			0.39				0.52			0.52
Clearance Time (s)		5.0			5.0				4.0			4.0
Vehicle Extension (s)		4.5			4.5				3.0			3.0
Lane Grp Cap (vph)		1418			2038				1469			849
v/s Ratio Prot		0.10			c0.35				0.22			c0.49
v/s Ratio Perm												
v/c Ratio		0.26			0.88				0.42			0.95
Uniform Delay, d1		20.5			28.2				14.9			23.0
Progression Factor		1.90			0.94				1.00			1.00
Incremental Delay, d2		0.4			4.7				0.2			20.5
Delay (s)		39.3			31.2				15.1			43.5
Level of Service		D			C				B			D
Approach Delay (s)		39.3			31.2			15.1			43.5	
Approach LOS		D			C			B			D	

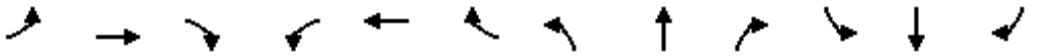
Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1101	114	51	1581	164	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	3610	1615	1805	3610	1766	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	3610	1615	1805	3610	1766	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1197	124	55	1718	178	67
RTOR Reduction (vph)	0	17	0	0	15	0
Lane Group Flow (vph)	1197	107	55	1718	230	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	66.5	66.5	5.0	74.5	18.0	
Effective Green, g (s)	66.5	66.5	5.0	74.5	18.0	
Actuated g/C Ratio	0.66	0.66	0.05	0.74	0.18	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2400	1073	90	2689	317	
v/s Ratio Prot	0.33		0.03	c0.48	c0.13	
v/s Ratio Perm		0.07				
v/c Ratio	0.50	0.10	0.61	0.64	0.73	
Uniform Delay, d1	8.4	6.0	46.5	6.2	38.7	
Progression Factor	0.96	1.03	0.79	2.56	1.00	
Incremental Delay, d2	0.7	0.2	6.4	0.9	8.0	
Delay (s)	8.8	6.4	43.2	16.8	46.7	
Level of Service	A	A	D	B	D	
Approach Delay (s)	8.6			17.6	46.7	
Approach LOS	A			B	D	

Intersection Summary			
Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

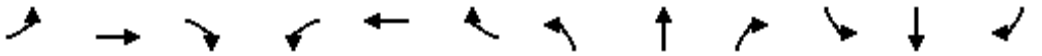
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	792	97	280	1317	14	54	56	120	32	84	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3610	1615	1805	3610	1615	1805	1900	1615	1805	3610	1615
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)	208	861	105	304	1432	15	59	61	130	35	91	197
RTOR Reduction (vph)	0	0	54	0	0	8	0	0	57	0	0	177
Lane Group Flow (vph)	208	861	51	304	1432	7	59	61	73	35	91	20
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	18.9	48.4	48.4	20.0	49.5	49.5	5.4	10.1	30.1	5.5	10.2	10.2
Effective Green, g (s)	18.9	48.4	48.4	20.0	49.5	49.5	5.4	10.1	30.1	5.5	10.2	10.2
Actuated g/C Ratio	0.19	0.48	0.48	0.20	0.50	0.50	0.05	0.10	0.30	0.06	0.10	0.10
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	341	1747	781	361	1786	799	97	191	486	99	368	164
v/s Ratio Prot	0.12	0.24		c0.17	c0.40		c0.03	c0.03	0.03	0.02	0.03	
v/s Ratio Perm			0.03			0.00			0.02			0.01
v/c Ratio	0.61	0.49	0.07	0.84	0.80	0.01	0.61	0.32	0.15	0.35	0.25	0.12
Uniform Delay, d1	37.2	17.5	13.7	38.5	21.1	12.8	46.3	41.8	25.6	45.5	41.4	40.8
Progression Factor	0.83	0.74	1.76	1.26	0.55	1.00	1.00	1.00	1.00	0.37	0.30	0.44
Incremental Delay, d2	1.9	0.9	0.1	6.7	1.5	0.0	7.2	1.7	0.1	0.8	0.6	0.6
Delay (s)	32.9	13.8	24.4	55.3	13.1	12.8	53.5	43.4	25.6	17.6	13.1	18.4
Level of Service	C	B	C	E	B	B	D	D	C	B	B	B
Approach Delay (s)		18.1			20.4			36.5			16.8	
Approach LOS		B			C			D			B	

Intersection Summary				
Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	68.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				



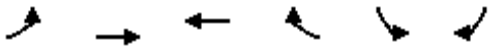
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	733	33	21	1690	42	242	134	40	14	32	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1823		1805	1900	1615
Flt Permitted	0.08	1.00	1.00	0.28	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	147	3610	1615	535	3610	1615		1823		1805	1900	1615
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)	23	797	36	23	1837	46	263	146	43	15	35	91
RTOR Reduction (vph)	0	0	17	0	0	16	0	3	0	0	0	85
Lane Group Flow (vph)	23	797	19	23	1837	30	0	449	0	15	35	6
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	51.8	51.8	51.8	51.8	51.8	51.8		31.3		6.4	6.4	6.4
Effective Green, g (s)	51.8	51.8	51.8	51.8	51.8	51.8		31.3		6.4	6.4	6.4
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.52	0.52		0.31		0.06	0.06	0.06
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	76	1869	836	277	1869	836		570		115	121	103
v/s Ratio Prot		0.22			c0.51			c0.25		0.01	c0.02	
v/s Ratio Perm	0.16		0.01	0.04		0.02						0.00
v/c Ratio	0.30	0.43	0.02	0.08	0.98	0.04		0.79		0.13	0.29	0.06
Uniform Delay, d1	13.8	14.9	11.8	12.1	23.7	11.8		31.3		44.2	44.6	44.0
Progression Factor	1.75	1.83	3.16	1.72	1.52	2.30		1.00		1.86	1.84	4.44
Incremental Delay, d2	9.1	0.7	0.0	0.3	11.5	0.0		7.1		0.5	1.3	0.2
Delay (s)	33.2	27.9	37.1	21.2	47.4	27.2		38.4		82.8	83.5	195.6
Level of Service	C	C	D	C	D	C		D		F	F	F
Approach Delay (s)		28.4			46.6			38.4			155.7	
Approach LOS		C			D			D			F	

Intersection Summary				
Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	85.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	585	71	148	1533	43	330	10	324	12	4	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.87	
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)	1805	3610	1615	1805	3610	1615	3502	1624		1805	1661	
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)	1805	3610	1615	1805	3610	1615	3502	1624		1805	1661	
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)	47	636	77	161	1666	47	359	11	352	13	4	21
RTOR Reduction (vph)	0	0	51	0	0	26	0	231	0	0	19	0
Lane Group Flow (vph)	47	636	26	161	1666	21	359	132	0	13	6	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	3.2	34.4	34.4	13.4	44.6	44.6	28.0	34.4		0.8	7.2	
Effective Green, g (s)	3.2	34.4	34.4	13.4	44.6	44.6	28.0	34.4		0.8	7.2	
Actuated g/C Ratio	0.03	0.34	0.34	0.13	0.45	0.45	0.28	0.34		0.01	0.07	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	4.5		3.0	3.0	
Lane Grp Cap (vph)	57	1241	555	241	1610	720	980	558		14	119	
v/s Ratio Prot	0.03	0.18		c0.09	c0.46		c0.10	c0.08		0.01	0.00	
v/s Ratio Perm			0.02			0.01						
v/c Ratio	0.82	0.51	0.05	0.67	1.03	0.03	0.37	0.24		0.93	0.05	
Uniform Delay, d1	48.1	26.1	21.9	41.2	27.7	15.5	28.9	23.4		49.6	43.2	
Progression Factor	1.59	0.60	1.00	1.22	0.59	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	56.5	1.4	0.1	5.6	29.9	0.1	1.1	1.0		201.0	0.2	
Delay (s)	132.9	17.2	22.0	56.0	46.2	15.6	29.9	24.4		250.5	43.4	
Level of Service	F	B	C	E	D	B	C	C		F	D	
Approach Delay (s)		24.8			46.3			27.2			114.2	
Approach LOS		C			D			C			F	

Intersection Summary				
Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	77.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

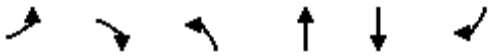


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	119	801	1620	0	500	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.10	1.00	1.00		0.95	1.00
Satd. Flow (perm)	195	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	123	826	1670	0	515	107
RTOR Reduction (vph)	0	0	0	0	0	33
Lane Group Flow (vph)	123	826	1670	0	515	74
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	72.8	72.8	72.8		19.7	19.7
Effective Green, g (s)	72.8	72.8	72.8		19.7	19.7
Actuated g/C Ratio	0.73	0.73	0.73		0.20	0.20
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	141	2628	2628		689	318
v/s Ratio Prot		0.23	0.46		c0.15	
v/s Ratio Perm	c0.63					0.05
v/c Ratio	0.87	0.31	0.64		0.75	0.23
Uniform Delay, d1	10.1	4.8	6.9		37.8	33.8
Progression Factor	1.47	0.43	0.91		0.70	0.55
Incremental Delay, d2	44.4	0.3	0.4		4.4	0.4
Delay (s)	59.3	2.4	6.7		31.0	19.0
Level of Service	E	A	A		C	B
Approach Delay (s)		9.7	6.7		28.9	
Approach LOS		A	A		C	

Intersection Summary			
Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	970	127	38	3033	691	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.23	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	441	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1054	138	41	3297	751	125
RTOR Reduction (vph)	0	27	0	0	0	35
Lane Group Flow (vph)	1054	111	41	3297	751	90
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	67.0	67.0	67.0	67.0	24.0	24.0
Effective Green, g (s)	67.0	67.0	67.0	67.0	24.0	24.0
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.24	0.24
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2418	1082	295	3475	840	387
v/s Ratio Prot	0.29			c0.64	c0.21	
v/s Ratio Perm		0.07	0.09			0.06
v/c Ratio	0.44	0.10	0.14	0.95	0.89	0.23
Uniform Delay, d1	7.7	5.8	6.0	14.9	36.8	30.6
Progression Factor	1.43	2.38	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	1.0	7.3	14.0	1.4
Delay (s)	11.6	14.1	7.0	22.2	50.8	32.0
Level of Service	B	B	A	C	D	C
Approach Delay (s)	11.8			22.0	48.1	
Approach LOS	B			C	D	

Intersection Summary			
Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

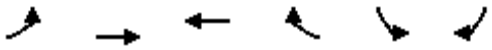


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	255	12	10	2212	592	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1805	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1805	1615	1805	3610	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	268	13	11	2328	623	179
RTOR Reduction (vph)	0	11	0	0	0	55
Lane Group Flow (vph)	268	2	11	2328	623	124
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	17.7	17.7	0.8	74.3	69.5	69.5
Effective Green, g (s)	17.7	17.7	0.8	74.3	69.5	69.5
Actuated g/C Ratio	0.18	0.18	0.01	0.74	0.70	0.70
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)	319	285	14	2682	2508	1122
v/s Ratio Prot	c0.15		0.01	c0.64	0.17	
v/s Ratio Perm		0.00				0.08
v/c Ratio	0.84	0.01	0.79	0.87	0.25	0.11
Uniform Delay, d1	39.8	33.9	49.5	9.3	5.6	5.0
Progression Factor	1.00	1.00	1.00	0.79	0.98	1.43
Incremental Delay, d2	17.7	0.0	65.3	1.5	0.2	0.2
Delay (s)	57.5	33.9	114.6	8.9	5.8	7.4
Level of Service	E	C	F	A	A	A
Approach Delay (s)	56.4			9.4	6.1	
Approach LOS	E			A	A	

Intersection Summary			
Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

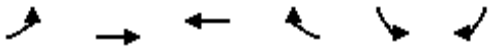
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1028	0	398	1045	955	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610		3502	3610	3502	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3610		3502	3610	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1117	0	433	1136	1038	330
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1117	0	433	1136	1038	330
Turn Type	NA		Prot	NA	Prot	Free
Protected Phases	2		1	6	8	
Permitted Phases						Free
Actuated Green, G (s)	40.0		14.6	58.6	33.4	100.0
Effective Green, g (s)	40.0		14.6	58.6	33.4	100.0
Actuated g/C Ratio	0.40		0.15	0.59	0.33	1.00
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.2	5.0	3.0	
Lane Grp Cap (vph)	1444		511	2115	1169	1615
v/s Ratio Prot	c0.31		c0.12	0.31	c0.30	
v/s Ratio Perm						0.20
v/c Ratio	0.77		0.85	0.54	0.89	0.20
Uniform Delay, d1	26.1		41.6	12.5	31.5	0.0
Progression Factor	1.00		1.35	0.78	1.14	1.00
Incremental Delay, d2	4.1		9.4	0.7	7.6	0.3
Delay (s)	30.2		65.6	10.5	43.5	0.3
Level of Service	C		E	B	D	A
Approach Delay (s)	30.2			25.7	33.0	
Approach LOS	C			C	C	

Intersection Summary			
Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



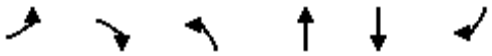
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	208	1109	1134	233	449	343
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3610	3610	1615	3502	1615
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3610	3610	1615	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	226	1205	1233	253	488	373
RTOR Reduction (vph)	0	0	0	124	0	272
Lane Group Flow (vph)	226	1205	1233	129	488	101
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	15.7	69.7	51.0	51.0	19.8	19.8
Effective Green, g (s)	15.7	69.7	51.0	51.0	19.8	19.8
Actuated g/C Ratio	0.16	0.70	0.51	0.51	0.20	0.20
Clearance Time (s)	3.0	6.0	6.0	6.0	4.5	4.5
Vehicle Extension (s)	1.5	5.0	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	283	2516	1841	823	693	319
v/s Ratio Prot	c0.13	0.33	c0.34		c0.14	
v/s Ratio Perm				0.08		0.06
v/c Ratio	0.80	0.48	0.67	0.16	0.70	0.32
Uniform Delay, d1	40.6	6.9	18.2	13.0	37.4	34.3
Progression Factor	0.44	2.34	0.82	1.29	1.00	1.00
Incremental Delay, d2	10.6	0.5	1.8	0.4	3.3	0.6
Delay (s)	28.4	16.6	16.7	17.2	40.6	34.9
Level of Service	C	B	B	B	D	C
Approach Delay (s)		18.5	16.8		38.1	
Approach LOS		B	B		D	

Intersection Summary			
Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



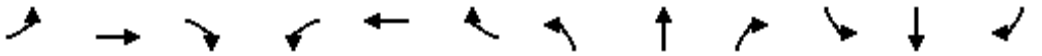
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Volume (vph)	0	1548	890	0	462	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.1	4.0
Lane Util. Factor		0.91	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5187	3610		1805	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5187	3610		1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1683	967	0	502	504
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1683	967	0	502	504
Turn Type		NA	NA		Prot	Free
Protected Phases		2	6		4	
Permitted Phases						Free
Actuated Green, G (s)		56.6	56.6		33.8	100.0
Effective Green, g (s)		56.6	56.6		33.8	100.0
Actuated g/C Ratio		0.57	0.57		0.34	1.00
Clearance Time (s)		5.5	5.5		4.1	
Vehicle Extension (s)		8.0	8.0		3.0	
Lane Grp Cap (vph)		2935	2043		610	1615
v/s Ratio Prot		c0.32	0.27		c0.28	
v/s Ratio Perm						0.31
v/c Ratio		0.57	0.47		0.82	0.31
Uniform Delay, d1		13.9	12.9		30.4	0.0
Progression Factor		1.21	1.07		1.00	1.00
Incremental Delay, d2		0.7	0.7		8.8	0.5
Delay (s)		17.6	14.5		39.2	0.5
Level of Service		B	B		D	A
Approach Delay (s)		17.6	14.5		19.8	
Approach LOS		B	B		B	

Intersection Summary			
Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	178	140	129	1195	1469	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.15	1.00	1.00	1.00
Satd. Flow (perm)	3502	1615	278	3610	3610	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	185	146	134	1245	1530	165
RTOR Reduction (vph)	0	62	0	0	0	33
Lane Group Flow (vph)	185	84	134	1245	1530	132
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	11.3	11.3	80.2	80.2	80.2	80.2
Effective Green, g (s)	11.3	11.3	80.2	80.2	80.2	80.2
Actuated g/C Ratio	0.11	0.11	0.80	0.80	0.80	0.80
Clearance Time (s)	3.0	3.0	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	395	182	222	2895	2895	1295
v/s Ratio Prot	c0.05			0.34	0.42	
v/s Ratio Perm		0.05	c0.48			0.08
v/c Ratio	0.47	0.46	0.60	0.43	0.53	0.10
Uniform Delay, d1	41.5	41.5	3.8	3.0	3.4	2.1
Progression Factor	1.16	1.22	0.72	0.64	3.17	6.42
Incremental Delay, d2	0.9	1.8	10.6	0.4	0.6	0.1
Delay (s)	49.0	52.5	13.3	2.3	11.4	13.8
Level of Service	D	D	B	A	B	B
Approach Delay (s)	50.5			3.4	11.6	
Approach LOS	D			A	B	

Intersection Summary			
Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



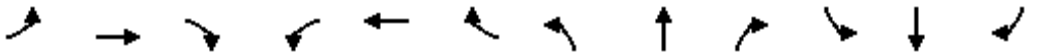
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	264	42	331	179	4	1	2	83	5	23	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3535		1805	3599		1805	1623			1793	
Flt Permitted	0.60	1.00		0.51	1.00		0.77	1.00			0.98	
Satd. Flow (perm)	1148	3535		963	3599		1470	1623			1765	
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)	3	343	55	430	232	5	1	3	108	6	30	22
RTOR Reduction (vph)	0	19	0	0	2	0	0	74	0	0	15	0
Lane Group Flow (vph)	3	379	0	430	235	0	1	37	0	0	43	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)	60.1	60.1		60.1	60.1		31.4	31.4			31.4	
Effective Green, g (s)	60.1	60.1		60.1	60.1		31.4	31.4			31.4	
Actuated g/C Ratio	0.60	0.60		0.60	0.60		0.31	0.31			0.31	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	689	2124		578	2162		461	509			554	
v/s Ratio Prot		0.11			0.07			0.02				
v/s Ratio Perm	0.00			c0.45			0.00				c0.02	
v/c Ratio	0.00	0.18		0.74	0.11		0.00	0.07			0.08	
Uniform Delay, d1	8.0	8.9		14.4	8.5		23.5	24.1			24.1	
Progression Factor	1.02	1.56		0.87	0.90		0.95	0.77			1.00	
Incremental Delay, d2	0.0	0.0		5.1	0.0		0.0	0.3			0.3	
Delay (s)	8.1	13.9		17.7	7.7		22.3	18.8			24.4	
Level of Service	A	B		B	A		C	B			C	
Approach Delay (s)		13.9			14.1			18.8			24.4	
Approach LOS		B			B			B			C	

Intersection Summary			
Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1448	1257	754	1651	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.6	5.6		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3610	1615	1805	3610		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3610	1615	1805	3610		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1574	1366	820	1795	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1574	1366	820	1795	0	0
Turn Type	NA	Free	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		Free				
Actuated Green, G (s)	42.5	100.0	46.4	100.0		
Effective Green, g (s)	42.5	100.0	46.4	100.0		
Actuated g/C Ratio	0.42	1.00	0.46	1.00		
Clearance Time (s)	5.5		5.6	5.6		
Vehicle Extension (s)	4.0		5.0	5.0		
Lane Grp Cap (vph)	1534	1615	837	3610		
v/s Ratio Prot	c0.44		c0.45	0.50		
v/s Ratio Perm		0.85				
v/c Ratio	1.03	0.85	0.98	0.50		
Uniform Delay, d1	28.8	0.0	26.3	0.0		
Progression Factor	0.87	1.00	0.84	1.00		
Incremental Delay, d2	29.8	5.6	26.1	0.5		
Delay (s)	55.0	5.6	48.3	0.5		
Level of Service	D	A	D	A		
Approach Delay (s)	32.1			15.5	0.0	
Approach LOS	C			B	A	

Intersection Summary			
Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.1
Intersection Capacity Utilization	91.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1448	0	0	1515	0	0	0	762	0	0	889
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0				4.0			4.0
Lane Util. Factor		0.95			0.95				*1.00			1.00
Frt		1.00			1.00				1.00			1.00
Flt Protected		1.00			1.00				1.00			1.00
Satd. Flow (prot)		3610			3610				3800			1900
Flt Permitted		1.00			1.00				1.00			1.00
Satd. Flow (perm)		3610			3610				3800			1900
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	1493	0	0	1562	0	0	0	786	0	0	916
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	12	0	0	12
Lane Group Flow (vph)	0	1493	0	0	1562	0	0	0	774	0	0	904
Turn Type		NA			NA				Prot			Prot
Protected Phases		2			6				3			7
Permitted Phases												
Actuated Green, G (s)		44.0			44.0				47.0			47.0
Effective Green, g (s)		44.0			44.0				47.0			47.0
Actuated g/C Ratio		0.44			0.44				0.47			0.47
Clearance Time (s)		5.0			5.0				4.0			4.0
Vehicle Extension (s)		4.5			4.5				3.0			3.0
Lane Grp Cap (vph)		1588			1588				1786			893
v/s Ratio Prot		0.41			c0.43				0.20			c0.48
v/s Ratio Perm												
v/c Ratio		0.94			0.98				0.43			1.01
Uniform Delay, d1		26.7			27.6				17.6			26.5
Progression Factor		0.22			1.20				1.00			1.00
Incremental Delay, d2		4.1			17.7				0.2			33.3
Delay (s)		10.0			50.8				17.8			59.8
Level of Service		A			D				B			E
Approach Delay (s)		10.0			50.8			17.8			59.8	
Approach LOS		A			D			B			E	

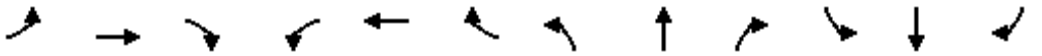
Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2160	49	36	1496	19	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	3.0	4.5	3.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.93	
Flt Protected	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (prot)	3610	1615	1805	3610	1721	
Flt Permitted	1.00	1.00	0.95	1.00	0.98	
Satd. Flow (perm)	3610	1615	1805	3610	1721	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2348	53	39	1626	21	25
RTOR Reduction (vph)	0	2	0	0	24	0
Lane Group Flow (vph)	2348	51	39	1626	22	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	81.0	81.0	3.6	87.6	4.9	
Effective Green, g (s)	81.0	81.0	3.6	87.6	4.9	
Actuated g/C Ratio	0.81	0.81	0.04	0.88	0.05	
Clearance Time (s)	4.5	4.5	3.0	4.5	3.0	
Vehicle Extension (s)	3.5	3.5	0.2	4.5	3.0	
Lane Grp Cap (vph)	2924	1308	64	3162	84	
v/s Ratio Prot	c0.65		c0.02	0.45	c0.01	
v/s Ratio Perm		0.03				
v/c Ratio	0.80	0.04	0.61	0.51	0.26	
Uniform Delay, d1	5.2	1.9	47.5	1.4	45.8	
Progression Factor	1.61	1.20	1.08	3.07	1.00	
Incremental Delay, d2	1.9	0.0	9.0	0.5	1.7	
Delay (s)	10.2	2.3	60.4	4.8	47.5	
Level of Service	B	A	E	A	D	
Approach Delay (s)	10.0			6.1	47.5	
Approach LOS	A			A	D	

Intersection Summary			
Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

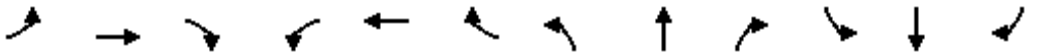
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	198	1900	35	93	1173	7	117	73	402	29	24	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Lane Util. Factor	1.00	*1.00	1.00	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	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3800	1615	1805	3800	1615	1805	1900	1615	1805	3800	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3800	1615	1805	3800	1615	1805	1900	1615	1805	3800	1615
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)	208	2000	37	98	1235	7	123	77	423	31	25	172
RTOR Reduction (vph)	0	0	17	0	0	4	0	0	63	0	0	157
Lane Group Flow (vph)	208	2000	20	98	1235	3	123	77	360	31	25	15
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	17.2	53.0	53.0	12.5	48.3	48.3	9.5	11.0	23.5	7.5	9.0	9.0
Effective Green, g (s)	17.2	53.0	53.0	12.5	48.3	48.3	9.5	11.0	23.5	7.5	9.0	9.0
Actuated g/C Ratio	0.17	0.53	0.53	0.12	0.48	0.48	0.10	0.11	0.24	0.08	0.09	0.09
Clearance Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.5	3.0	3.0	5.5	5.5
Vehicle Extension (s)	2.0	4.0	4.0	0.2	4.0	4.0	0.2	4.5	0.2	0.2	4.5	4.5
Lane Grp Cap (vph)	310	2014	855	225	1835	780	171	209	379	135	342	145
v/s Ratio Prot	c0.12	c0.53		0.05	0.33		c0.07	0.04	c0.12	0.02	0.01	
v/s Ratio Perm			0.01			0.00			0.10			0.01
v/c Ratio	0.67	0.99	0.02	0.44	0.67	0.00	0.72	0.37	0.95	0.23	0.07	0.11
Uniform Delay, d1	38.8	23.3	11.2	40.5	19.8	13.4	44.0	41.3	37.7	43.5	41.7	41.8
Progression Factor	1.04	0.69	1.00	1.25	0.68	1.00	1.00	1.00	1.00	1.01	0.91	0.86
Incremental Delay, d2	2.9	14.5	0.0	0.4	1.7	0.0	11.4	1.9	33.3	0.3	0.2	0.6
Delay (s)	43.1	30.6	11.2	51.1	15.2	13.4	55.3	43.2	71.0	44.4	37.9	36.4
Level of Service	D	C	B	D	B	B	E	D	E	D	D	D
Approach Delay (s)		31.4			17.8			64.4			37.7	
Approach LOS		C			B			E			D	

Intersection Summary			
Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



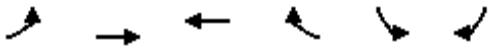
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	2179	305	45	1148	7	85	25	15	25	113	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615		1808		1805	1900	1615
Flt Permitted	0.17	1.00	1.00	0.06	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	324	3610	1615	116	3610	1615		1808		1805	1900	1615
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)	70	2368	332	49	1248	8	92	27	16	27	123	15
RTOR Reduction (vph)	0	0	59	0	0	3	0	6	0	0	0	13
Lane Group Flow (vph)	70	2368	273	49	1248	5	0	129	0	27	123	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	65.3	65.3	65.3	65.3	65.3	65.3		12.4		11.8	11.8	11.8
Effective Green, g (s)	65.3	65.3	65.3	65.3	65.3	65.3		12.4		11.8	11.8	11.8
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.65	0.65		0.12		0.12	0.12	0.12
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		3.0		3.0	3.0	3.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	211	2357	1054	75	2357	1054		224		212	224	190
v/s Ratio Prot		c0.66			0.35			c0.07		0.01	c0.06	
v/s Ratio Perm	0.22		0.17	0.42		0.00						0.00
v/c Ratio	0.33	1.00	0.26	0.65	0.53	0.00		0.58		0.13	0.55	0.01
Uniform Delay, d1	7.7	17.4	7.2	10.5	9.2	6.0		41.3		39.5	41.6	38.9
Progression Factor	1.50	1.22	2.03	1.12	0.83	1.00		1.00		0.92	0.90	1.00
Incremental Delay, d2	2.1	14.1	0.3	28.9	0.6	0.0		3.5		0.2	2.4	0.0
Delay (s)	13.6	35.3	15.0	40.7	8.3	6.0		44.9		36.7	39.7	39.0
Level of Service	B	D	B	D	A	A		D		D	D	D
Approach Delay (s)		32.4			9.5			44.9			39.2	
Approach LOS		C			A			D			D	

Intersection Summary				
Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	80.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1496	581	293	1214	23	107	5	96	23	7	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.88	
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)	1805	3610	1615	1805	3610	1615	3502	1628		1805	1664	
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)	1805	3610	1615	1805	3610	1615	3502	1628		1805	1664	
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)	25	1626	632	318	1320	25	116	5	104	25	8	39
RTOR Reduction (vph)	0	0	126	0	0	13	0	70	0	0	35	0
Lane Group Flow (vph)	25	1626	506	318	1320	12	116	39	0	25	12	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	1.6	35.6	35.6	13.0	47.0	47.0	24.0	32.4		2.0	10.4	
Effective Green, g (s)	1.6	35.6	35.6	13.0	47.0	47.0	24.0	32.4		2.0	10.4	
Actuated g/C Ratio	0.02	0.36	0.36	0.13	0.47	0.47	0.24	0.32		0.02	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5		4.0	4.0	
Vehicle Extension (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	4.5		3.0	3.0	
Lane Grp Cap (vph)	28	1285	574	234	1696	759	840	527		36	173	
v/s Ratio Prot	0.01	c0.45		c0.18	0.37		c0.03	c0.02		c0.01	0.01	
v/s Ratio Perm			0.31			0.01						
v/c Ratio	0.89	1.27	0.88	1.36	0.78	0.02	0.14	0.07		0.69	0.07	
Uniform Delay, d1	49.1	32.2	30.2	43.5	22.1	14.1	29.9	23.4		48.7	40.4	
Progression Factor	1.28	0.73	0.58	1.21	0.44	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	52.5	121.1	5.3	182.7	3.0	0.0	0.3	0.3		44.9	0.2	
Delay (s)	115.6	144.6	22.9	235.2	12.6	14.2	30.2	23.7		93.6	40.6	
Level of Service	F	F	C	F	B	B	C	C		F	D	
Approach Delay (s)		110.6			55.2			27.0			59.0	
Approach LOS		F			E			C			E	

Intersection Summary				
Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	78.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

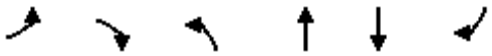


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	59	1553	1364	0	1198	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3610	3610		3502	1615
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	224	3610	3610		3502	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	61	1601	1406	0	1235	172
RTOR Reduction (vph)	0	0	0	0	0	33
Lane Group Flow (vph)	61	1601	1406	0	1235	139
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	60.5	60.5	60.5		32.0	32.0
Effective Green, g (s)	60.5	60.5	60.5		32.0	32.0
Actuated g/C Ratio	0.60	0.60	0.60		0.32	0.32
Clearance Time (s)	4.5	4.5	4.5		3.0	3.0
Vehicle Extension (s)	4.5	4.5	4.5		3.0	3.0
Lane Grp Cap (vph)	135	2184	2184		1120	516
v/s Ratio Prot		c0.44	0.39		c0.35	
v/s Ratio Perm	0.27					0.09
v/c Ratio	0.45	0.73	0.64		1.10	0.27
Uniform Delay, d1	10.7	14.0	12.8		34.0	25.3
Progression Factor	0.99	0.95	1.16		1.09	1.52
Incremental Delay, d2	1.0	0.2	1.2		57.9	0.2
Delay (s)	11.6	13.6	16.0		94.8	38.8
Level of Service	B	B	B		F	D
Approach Delay (s)		13.5	16.0		88.0	
Approach LOS		B	B		F	

Intersection Summary			
Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2184	555	70	2112	290	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3610	1615	1805	5187	3502	1615
Flt Permitted	1.00	1.00	0.05	1.00	0.95	1.00
Satd. Flow (perm)	3610	1615	101	5187	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2374	603	76	2296	315	118
RTOR Reduction (vph)	0	52	0	0	0	12
Lane Group Flow (vph)	2374	551	76	2296	315	106
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	75.0	75.0	75.0	75.0	16.0	16.0
Effective Green, g (s)	75.0	75.0	75.0	75.0	16.0	16.0
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.16	0.16
Clearance Time (s)	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.0	3.0
Lane Grp Cap (vph)	2707	1211	75	3890	560	258
v/s Ratio Prot	0.66			0.44	c0.09	
v/s Ratio Perm		0.34	c0.75			0.07
v/c Ratio	0.88	0.45	1.01	0.59	0.56	0.41
Uniform Delay, d1	9.1	4.7	12.5	5.6	38.8	37.8
Progression Factor	1.61	1.39	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.6	107.7	0.7	4.0	4.8
Delay (s)	16.9	7.2	120.2	6.3	42.8	42.6
Level of Service	B	A	F	A	D	D
Approach Delay (s)	15.0			9.9	42.7	
Approach LOS	B			A	D	

Intersection Summary			
Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	235	13	15	1087	1352	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1805	1615	1805	3610	3610	1615
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1805	1615	1805	3610	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	14	16	1144	1423	231
RTOR Reduction (vph)	0	11	0	0	0	76
Lane Group Flow (vph)	247	3	16	1144	1423	155
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	18.8	18.8	2.2	73.2	67.0	67.0
Effective Green, g (s)	18.8	18.8	2.2	73.2	67.0	67.0
Actuated g/C Ratio	0.19	0.19	0.02	0.73	0.67	0.67
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)	339	303	39	2642	2418	1082
v/s Ratio Prot	c0.14		0.01	c0.32	c0.39	
v/s Ratio Perm		0.00				0.10
v/c Ratio	0.73	0.01	0.41	0.43	0.59	0.14
Uniform Delay, d1	38.2	33.0	48.3	5.3	9.0	6.0
Progression Factor	1.00	1.00	1.10	0.81	0.64	0.29
Incremental Delay, d2	7.6	0.0	5.7	0.4	0.9	0.2
Delay (s)	45.8	33.0	58.6	4.7	6.7	2.0
Level of Service	D	C	E	A	A	A
Approach Delay (s)	45.1			5.4	6.0	
Approach LOS	D			A	A	

Intersection Summary			
Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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APPENDIX O:

EXISTING PLUS PROJECT CONDITIONS HCS2010 FREEWAY SEGMENT, HCS2010 RAMP JUNCTION, AND QUEUING ANALYSIS WORKSHEETS

HCS2010 FREEWAY SEGMENT ANALYSIS WORKSHEETS

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*South of Live Oak Ave*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4310*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1212*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2931*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*824*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*11.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3228*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*908*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*13.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3686*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1037*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*14.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4878*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1372*	pc/h/ln
S	*69.7*	mph
D = v_p / S	*19.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbond*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3825*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1076*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5235*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1472*	pc/h/ln
S	*69.1*	mph
D = v_p / S	*21.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6131*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1724*	pc/h/ln
S	*66.8*	mph
D = v_p / S	*25.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2930*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*824*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*11.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3037*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*854*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*12.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3500*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*984*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*14.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow Hwy*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4672*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1314*	pc/h/ln
S	*69.8*	mph
D = v_p / S	*18.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbond*
Agency or Company	*Urban Crossroads*	From/To	*BW Arrow Hwy and Live Oak*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3946*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1110*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.9*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5617*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1580*	pc/h/ln
S	*68.3*	mph
D = v_p / S	*23.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7602*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2138*	pc/h/ln
S	*59.8*	mph
D = v_p / S	*35.8*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6998*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1968*	pc/h/ln
S	*63.2*	mph
D = v_p / S	*31.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*West of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7999*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2250*	pc/h/ln
S	*57.2*	mph
D = v_p / S	*39.3*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*West of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7825*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2201*	pc/h/ln
S	*58.4*	mph
D = v_p / S	*37.7*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6286*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1768*	pc/h/ln
S	*66.3*	mph
D = v_p / S	*26.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6775*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1905*	pc/h/ln
S	*64.2*	mph
D = v_p / S	*29.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7049*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1983*	pc/h/ln
S	*62.9*	mph
D = v_p / S	*31.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6521*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1834*	pc/h/ln
S	*65.3*	mph
D = v_p / S	*28.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7252*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2040*	pc/h/ln
S	*61.8*	mph
D = v_p / S	*33.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6508*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1830*	pc/h/ln
S	*65.4*	mph
D = v_p / S	*28.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*BW Irwindale Off & On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5686*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1599*	pc/h/ln
S	*68.2*	mph
D = v_p / S	*23.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*East of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*Existing + Project*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6590*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1853*	pc/h/ln
S	*65.1*	mph
D = v_p / S	*28.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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HCS2010 RAMP JUNCTION ANALYSIS WORKSHEETS

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 297 veh/h
	Freeway Volume, V_F: 4310	
	Ramp Volume, V_R: 1379	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4310	0.92	Level	7	0	0.966	1.00	4849
Ramp	1379	0.92	Level	0	0	1.000	1.00	1499
UpStream								
DownStream	297	0.92	Level	0	0	1.000	1.00	323

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 2960 pc/h

V_3 or V_{av34} 944 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4849	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	3350	Exhibit 13-8	9600	No
V_R	1499	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2960	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 27.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.563 (Exhibit 13-12)

S_R = 54.2 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 61.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = 1000 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 458 veh/h
	Freeway Volume, V_F: 2931	
	Ramp Volume, V_R: 297	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2931	0.92	Level	7	0	0.966	1.00	3297
Ramp	297	0.92	Level	0	0	1.000	1.00	323
UpStream								
DownStream	458	0.92	Level	0	0	1.000	1.00	498

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.177 using Equation (Exhibit 13-6)

V_{12} = 585 pc/h

V_3 or V_{av34} = 1356 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1318 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3620	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1641	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 13.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.292 (Exibit 13-11)

S_R = 61.8 mph (Exhibit 13-11)

S_0 = 68.2 mph (Exhibit 13-11)

S = 65.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☑ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1000 ft	Acceleration Lane Length, L_A: 730	L_{down} = ft
V_u = 297 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3228	
	Ramp Volume, V_R: 458	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3228	0.92	Level	7	0	0.966	1.00	3631
Ramp	458	0.92	Level	0	0	1.000	1.00	498
UpStream	297	0.92	Level	0	0	1.000	1.00	323
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.156 using Equation (Exhibit 13-6)

V_{12} = 565 pc/h

V_3 or V_{av34} 1533 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1452 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4129	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1950	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 15.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.297 (Exibit 13-11)

S_R= 61.7 mph (Exhibit 13-11)

S_0= 67.9 mph (Exhibit 13-11)

S = 64.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4300 ft
V_u = veh/h	Deceleration Lane Length L_D: 230	V_D = 1410 veh/h
	Freeway Volume, V_F: 4878	
	Ramp Volume, V_R: 1053	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4878	0.92	Level	7	0	0.966	1.00	5488
Ramp	1053	0.92	Level	0	0	1.000	1.00	1145
UpStream								
DownStream	1410	0.92	Level	0	0	1.000	1.00	1533

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3039 pc/h

V_3 or V_{av34} 1224 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5488	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	4343	Exhibit 13-8	9600	No
V_R	1145	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3039	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.531 (Exhibit 13-12)

S_R = 55.1 mph (Exhibit 13-12)

S_0 = 75.9 mph (Exhibit 13-12)

S = 62.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 1053 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3825	
	Ramp Volume, V_R: 1410	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3825	0.92	Level	7	0	0.966	1.00	4303
Ramp	1410	0.92	Level	0	0	1.000	1.00	1533
UpStream	1053	0.92	Level	0	0	1.000	1.00	1145
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.026 using Equation (Exhibit 13-6)

V_{12} = 113 pc/h

V_3 or V_{av34} = 2095 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1721 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5836	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3254	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.373 (Exibit 13-11)

S_R = 59.6 mph (Exhibit 13-11)

S_0 = 67.2 mph (Exhibit 13-11)

S = 62.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 107 veh/h
	Freeway Volume, V_F: 4312	
	Ramp Volume, V_R: 1382	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4312	0.92	Level	7	0	0.966	1.00	4851
Ramp	1382	0.92	Level	0	0	1.000	1.00	1502
UpStream								
DownStream	107	0.92	Level	0	0	1.000	1.00	116

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 2962 pc/h

V_3 or V_{av34} 944 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4851	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	3349	Exhibit 13-8	9600	No
V_R	1502	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2962	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 27.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.563 (Exhibit 13-12)

S_R = 54.2 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 61.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	700
Deceleration Lane Length L_D	
Freeway Volume, V_F	2930
Ramp Volume, V_R	107
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 1000 ft

V_D = 463 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2930	0.92	Level	7	0	0.966	1.00	3296
Ramp	107	0.92	Level	0	0	1.000	1.00	116
UpStream								
DownStream	463	0.92	Level	0	0	1.000	1.00	503

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.203 using Equation (Exhibit 13-6)

V_{12} = 670 pc/h

V_3 or V_{av34} = 1313 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1318 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3412	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1434	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 12.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.288 (Exibit 13-11)

S_R = 61.9 mph (Exhibit 13-11)

S_0 = 68.2 mph (Exhibit 13-11)

S = 65.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 1000 ft

V_u = 107 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	730
Deceleration Lane Length L_D	
Freeway Volume, V_F	3037
Ramp Volume, V_R	463
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3037	0.92	Level	7	0	0.966	1.00	3417
Ramp	463	0.92	Level	0	0	1.000	1.00	503
UpStream	107	0.92	Level	0	0	1.000	1.00	116
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.155 using Equation (Exhibit 13-6)

V_{12} = 529 pc/h

V_3 or V_{av34} = 1444 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1366 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3920	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1869	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 15.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.295 (Exibit 13-11)

S_R = 61.7 mph (Exhibit 13-11)

S_0 = 68.1 mph (Exhibit 13-11)

S = 64.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4300 ft
V_u = veh/h	Deceleration Lane Length L_D: 230	V_D = 1671 veh/h
	Freeway Volume, V_F: 4672	
	Ramp Volume, V_R: 726	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4672	0.92	Level	7	0	0.966	1.00	5256
Ramp	726	0.92	Level	0	0	1.000	1.00	789
UpStream								
DownStream	1671	0.92	Level	0	0	1.000	1.00	1816

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 2737 pc/h

V_3 or V_{av34} 1259 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5256	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	4467	Exhibit 13-8	9600	No
V_R	789	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2737	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 25.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.499 (Exhibit 13-12)

S_R = 56.0 mph (Exhibit 13-12)

S_0 = 75.8 mph (Exhibit 13-12)

S = 64.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 726 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3946	
	Ramp Volume, V_R: 1671	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3946	0.92	Level	7	0	0.966	1.00	4439
Ramp	1671	0.92	Level	0	0	1.000	1.00	1816
UpStream	726	0.92	Level	0	0	1.000	1.00	789
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = -0.009 using Equation (Exhibit 13-6)

V_{12} = -40 pc/h

V_3 or V_{av34} 2239 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1775 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6255	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3591	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 28.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.413 (Exibit 13-11)

S_R= 58.4 mph (Exhibit 13-11)

S_0= 67.0 mph (Exhibit 13-11)

S = 61.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7602	
	Ramp Volume, V_R: 604	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7602	0.92	Level	7	0	0.966	1.00	8552
Ramp	604	0.92	Level	0	0	1.000	1.00	657
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4099 pc/h

V_3 or V_{av34} 2226 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8552	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7895	Exhibit 13-8	9600	No
V_R	657	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4099	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.9 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.487 (Exhibit 13-12)

S_R = 56.4 mph (Exhibit 13-12)

S_0 = 72.0 mph (Exhibit 13-12)

S = 63.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6998	
	Ramp Volume, V_R: 540	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6998	0.92	Level	7	0	0.966	1.00	7873
Ramp	540	0.92	Level	0	0	1.000	1.00	587
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.144 using Equation (Exhibit 13-6)

V_{12} = 1137 pc/h

V_3 or V_{av34} 3368 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3149 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8460	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3736	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 31.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.450 (Exibit 13-11)

S_R= 57.4 mph (Exhibit 13-11)

S_0= 63.1 mph (Exhibit 13-11)

S = 60.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7538	
	Ramp Volume, V_R: 461	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7538	0.92	Level	7	0	0.966	1.00	8480
Ramp	461	0.92	Level	0	0	1.000	1.00	501
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.155 using Equation (Exhibit 13-6)

V_{12} = 1316 pc/h

V_3 or V_{av34} 3582 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3392 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8981	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3893	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 31.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.463 (Exibit 13-11)

S_R= 57.0 mph (Exhibit 13-11)

S_0= 62.0 mph (Exhibit 13-11)

S = 59.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7825	
	Ramp Volume, V_R: 1539	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7825	0.92	Level	7	0	0.966	1.00	8803
Ramp	1539	0.92	Level	0	0	1.000	1.00	1673
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 3527 pc/h

V_3 or V_{av34} 2638 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8803	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7130	Exhibit 13-8	9600	No
V_R	1673	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3527	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 22.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.579 (Exhibit 13-12)

S_R= 53.8 mph (Exhibit 13-12)

S_0= 70.4 mph (Exhibit 13-12)

S = 62.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6286	
	Ramp Volume, V_R: 489	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6286	0.92	Level	7	0	0.966	1.00	7072
Ramp	489	0.92	Level	0	0	1.000	1.00	532
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.151 using Equation (Exhibit 13-6)

V_{12} = 1070 pc/h

V_3 or V_{av34} 3001 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2828 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7604	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3360	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.370 (Exibit 13-11)

S_R= 59.6 mph (Exhibit 13-11)

S_0= 64.2 mph (Exhibit 13-11)

S = 62.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7049	
	Ramp Volume, V_R: 528	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7049	0.92	Level	7	0	0.966	1.00	7930
Ramp	528	0.92	Level	0	0	1.000	1.00	574
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3781 pc/h

V_3 or V_{av34} 2074 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7930	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7356	Exhibit 13-8	9600	No
V_R	574	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3781	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.480 (Exhibit 13-12)

S_R = 56.6 mph (Exhibit 13-12)

S_0 = 72.6 mph (Exhibit 13-12)

S = 64.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6521	
	Ramp Volume, V_R: 448	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6521	0.92	Level	7	0	0.966	1.00	7336
Ramp	448	0.92	Level	0	0	1.000	1.00	487
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.157 using Equation (Exhibit 13-6)

V_{12} = 1151 pc/h

V_3 or V_{av34} 3092 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2934 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7823	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3421	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.405 (Exibit 13-11)

S_R= 58.7 mph (Exhibit 13-11)

S_0= 63.9 mph (Exhibit 13-11)

S = 61.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6969	
	Ramp Volume, V_R: 283	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6969	0.92	Level	7	0	0.966	1.00	7840
Ramp	283	0.92	Level	0	0	1.000	1.00	308
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.179 using Equation (Exhibit 13-6)

V_{12} = 1406 pc/h

V_3 or V_{av34} 3217 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3136 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8148	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3444	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 27.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.394 (Exibit 13-11)

S_R= 59.0 mph (Exhibit 13-11)

S_0= 63.2 mph (Exhibit 13-11)

S = 61.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 6508	
	Ramp Volume, V_R: 822	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6508	0.92	Level	7	0	0.966	1.00	7321
Ramp	822	0.92	Level	0	0	1.000	1.00	893
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 2564 pc/h

V_3 or V_{av34} 2378 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2928 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7321	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6428	Exhibit 13-8	9600	No
V_R	893	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2564	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 17.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.508 (Exhibit 13-12)

S_R = 55.8 mph (Exhibit 13-12)

S_0 = 72.1 mph (Exhibit 13-12)

S = 64.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing + Project

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 5686	
	Ramp Volume, V_R: 904	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5686	0.92	Level	7	0	0.966	1.00	6397
Ramp	904	0.92	Level	0	0	1.000	1.00	983
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.095 using Equation (Exhibit 13-6)

V_{12} = 607 pc/h

V_3 or V_{av34} 2895 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2558 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7380	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3541	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 27.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.393 (Exibit 13-11)

S_R= 59.0 mph (Exhibit 13-11)

S_0= 64.9 mph (Exhibit 13-11)

S = 61.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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QUEUING ANALYSIS WORKSHEETS

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB
Directions Served	T	T	T	T	T	L
Maximum Queue (ft)	103	137	80	292	350	420
Average Queue (ft)	69	96	42	208	280	323
95th Queue (ft)	113	152	94	328	401	491
Link Distance (ft)	1028	1028		328	328	649
Upstream Blk Time (%)				0	4	
Queuing Penalty (veh)				3	35	
Storage Bay Dist (ft)			210			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB	WB
Directions Served	T	T	L	T
Maximum Queue (ft)	114	128	185	32
Average Queue (ft)	74	84	118	6
95th Queue (ft)	125	141	203	63
Link Distance (ft)	2251	2251		290
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			360	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	WB	WB	NB	SB
Directions Served	T	T	R	R
Maximum Queue (ft)	13	44	455	387
Average Queue (ft)	3	15	399	365
95th Queue (ft)	26	50	572	438
Link Distance (ft)	104	104	440	372
Upstream Blk Time (%)		0	59	72
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 38

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB
Directions Served	T	T	T	T	T	L
Maximum Queue (ft)	219	252	44	102	153	360
Average Queue (ft)	123	144	17	59	101	251
95th Queue (ft)	240	275	47	115	181	405
Link Distance (ft)	1028	1028		328	328	649
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			210			
Storage Blk Time (%)		3				
Queuing Penalty (veh)		10				

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB	WB
Directions Served	T	T	L	T
Maximum Queue (ft)	293	323	236	151
Average Queue (ft)	232	254	181	30
95th Queue (ft)	337	347	271	161
Link Distance (ft)	2251	2251		290
Upstream Blk Time (%)			1	0
Queuing Penalty (veh)			0	3
Storage Bay Dist (ft)			360	
Storage Blk Time (%)			1	0
Queuing Penalty (veh)			3	2

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	EB	WB	WB	NB	SB
Directions Served	T	T	T	R	R
Maximum Queue (ft)	3	20	47	455	387
Average Queue (ft)	1	4	12	445	374
95th Queue (ft)	6	39	58	492	444
Link Distance (ft)	290	104	104	440	372
Upstream Blk Time (%)		0	0	74	84
Queuing Penalty (veh)		0	1	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 19

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APPENDIX P:

INTERIM YEAR (2017) WITHOUT PROJECT HCS2010 FREEWAY SEGMENT, HCS2010 RAMP JUNCTION, AND QUEUING ANALYSIS WORKSHEETS

HCS2010 FREEWAY SEGMENT ANALYSIS WORKSHEETS

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4596*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1293*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3177*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*894*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*12.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3527*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*992*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*14.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3846*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1082*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5170*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1454*	pc/h/ln
S	*69.3*	mph
D = v_p / S	*21.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbond*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4123*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1160*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*South of Live Oak Ave*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5496*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1546*	pc/h/ln
S	*68.6*	mph
D = v_p / S	*22.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/213*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4666*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1312*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3252*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*915*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*13.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3523*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*991*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*14.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3864*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1087*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow Hwy*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4999*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1406*	pc/h/ln
S	*69.5*	mph
D = v_p / S	*20.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbond*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4264*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1199*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2017 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6021*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1693*	pc/h/ln
S	*67.2*	mph
D = v_p / S	*25.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*East of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7794*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2192*	pc/h/ln
S	*58.6*	mph
D = v_p / S	*37.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7129*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2005*	pc/h/ln
S	*62.5*	mph
D = v_p / S	*32.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*West of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8211*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2309*	pc/h/ln
S	*55.7*	mph
D = v_p / S	*41.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*West of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8076*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2271*	pc/h/ln
S	*56.7*	mph
D = v_p / S	*40.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6414*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1804*	pc/h/ln
S	*65.8*	mph
D = v_p / S	*27.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*East of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6949*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1954*	pc/h/ln
S	*63.4*	mph
D = v_p / S	*30.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*East of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7261*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2042*	pc/h/ln
S	*61.8*	mph
D = v_p / S	*33.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6682*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1879*	pc/h/ln
S	*64.7*	mph
D = v_p / S	*29.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*West of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7482*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2104*	pc/h/ln
S	*60.5*	mph
D = v_p / S	*34.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6728*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1892*	pc/h/ln
S	*64.4*	mph
D = v_p / S	*29.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5832*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1640*	pc/h/ln
S	*67.8*	mph
D = v_p / S	*24.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2017NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6811*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1916*	pc/h/ln
S	*64.1*	mph
D = v_p / S	*29.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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HCS2010 RAMP JUNCTION ANALYSIS WORKSHEETS

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 350 veh/h
	Freeway Volume, V_F: 4596	
	Ramp Volume, V_R: 1419	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4596	0.92	Level	7	0	0.966	1.00	5170
Ramp	1419	0.92	Level	0	0	1.000	1.00	1542
UpStream								
DownStream	350	0.92	Level	0	0	1.000	1.00	380

Merge Areas | **Diverge Areas**

Estimation of v_{12}

Merge Areas

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3124 pc/h

V_3 or V_{av34} 1023 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Merge Areas

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Diverge Areas

	Actual	Capacity		LOS F?
V_F	5170	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	3628	Exhibit 13-8	9600	No
V_R	1542	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3124	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

Merge Areas

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Diverge Areas

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

Merge Areas

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

D_s = 0.567 (Exhibit 13-12)

S_R = 54.1 mph (Exhibit 13-12)

S_0 = 76.7 mph (Exhibit 13-12)

S = 61.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = 1000 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 319 veh/h
	Freeway Volume, V_F: 3177	
	Ramp Volume, V_R: 350	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3177	0.92	Level	7	0	0.966	1.00	3574
Ramp	350	0.92	Level	0	0	1.000	1.00	380
UpStream								
DownStream	319	0.92	Level	0	0	1.000	1.00	347

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.170 using Equation (Exhibit 13-6)

V_{12} = 609 pc/h

V_3 or V_{av34} = 1482 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1429 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3954	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1809	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 15.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.296 (Exibit 13-11)

S_R = 61.7 mph (Exhibit 13-11)

S_0 = 67.9 mph (Exhibit 13-11)

S = 64.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☑ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1000 ft	Acceleration Lane Length, L_A: 730	L_{down} = ft
V_u = 350 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3527	
	Ramp Volume, V_R: 319	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3527	0.92	Level	7	0	0.966	1.00	3968
Ramp	319	0.92	Level	0	0	1.000	1.00	347
UpStream	350	0.92	Level	0	0	1.000	1.00	380
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.174 using Equation (Exhibit 13-6)

V_{12} = 692 pc/h

V_3 or V_{av34} 1638 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1587 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4315	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1934	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 15.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.297 (Exibit 13-11)

S_R= 61.7 mph (Exhibit 13-11)

S_0= 67.5 mph (Exhibit 13-11)

S = 64.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	230
Freeway Volume, V_F	5170
Ramp Volume, V_R	1047
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 4300 ft
V_D = 1373 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5170	0.92	Level	7	0	0.966	1.00	5816
Ramp	1047	0.92	Level	0	0	1.000	1.00	1138
UpStream								
DownStream	1373	0.92	Level	0	0	1.000	1.00	1492

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 0.436 using Equation (Exhibit 13-7)
V_{12} = 3178 pc/h
V_3 or V_{av34} 1319 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5816	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	4678	Exhibit 13-8	9600	No
V_R	1138	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3178	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 29.5 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.530 (Exhibit 13-12)
S_R= 55.1 mph (Exhibit 13-12)
S_0= 75.5 mph (Exhibit 13-12)
S = 62.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 1047 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4123	
	Ramp Volume, V_R: 1373	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4123	0.92	Level	7	0	0.966	1.00	4638
Ramp	1373	0.92	Level	0	0	1.000	1.00	1492
UpStream	1047	0.92	Level	0	0	1.000	1.00	1138
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.031 using Equation (Exhibit 13-6)

V_{12} = 145 pc/h

V_3 or V_{av34} 2246 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1855 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6130	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3347	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 26.5 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.383 (Exibit 13-11)

S_R= 59.3 mph (Exhibit 13-11)

S_0= 66.8 mph (Exhibit 13-11)

S = 62.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 271 veh/h
	Freeway Volume, V_F: 4666	
	Ramp Volume, V_R: 1414	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4666	0.92	Level	7	0	0.966	1.00	5249
Ramp	1414	0.92	Level	0	0	1.000	1.00	1537
UpStream								
DownStream	271	0.92	Level	0	0	1.000	1.00	295

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3155 pc/h

V_3 or V_{av34} 1047 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5249	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	3712	Exhibit 13-8	9600	No
V_R	1537	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3155	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 29.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.566 (Exhibit 13-12)

S_R = 54.1 mph (Exhibit 13-12)

S_0 = 76.6 mph (Exhibit 13-12)

S = 61.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = 1000 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 341 veh/h
	Freeway Volume, V_F: 3252	
	Ramp Volume, V_R: 271	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3252	0.92	Level	7	0	0.966	1.00	3658
Ramp	271	0.92	Level	0	0	1.000	1.00	295
UpStream								
DownStream	341	0.92	Level	0	0	1.000	1.00	371

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.181 using Equation (Exhibit 13-6)

V_{12} = 662 pc/h

V_3 or V_{av34} = 1498 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1463 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3953	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1758	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 14.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.295 (Exibit 13-11)

S_R = 61.8 mph (Exhibit 13-11)

S_0 = 67.9 mph (Exhibit 13-11)

S = 65.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	730	☑ No	☐ Off
L_{up} =	1000 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	271 veh/h	Freeway Volume, V_F	3523	V_D =	veh/h
		Ramp Volume, V_R	341		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3523	0.92	Level	7	0	0.966	1.00	3963
Ramp	341	0.92	Level	0	0	1.000	1.00	371
UpStream	271	0.92	Level	0	0	1.000	1.00	295
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.171 using Equation (Exhibit 13-6)

V_{12} = 679 pc/h

V_3 or V_{av34} 1642 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1585 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4334	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1956	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 16.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.297 (Exibit 13-11)

S_R= 61.7 mph (Exhibit 13-11)

S_0= 67.5 mph (Exhibit 13-11)

S = 64.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4300 ft
V_u = veh/h	Deceleration Lane Length L_D: 230	V_D = 1757 veh/h
	Freeway Volume, V_F: 4999	
	Ramp Volume, V_R: 735	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4999	0.92	Level	7	0	0.966	1.00	5624
Ramp	735	0.92	Level	0	0	1.000	1.00	799
UpStream								
DownStream	1757	0.92	Level	0	0	1.000	1.00	1910

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 2903 pc/h

V_3 or V_{av34} 1360 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5624	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	4825	Exhibit 13-8	9600	No
V_R	799	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2903	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 27.1 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.500 (Exhibit 13-12)

S_R = 56.0 mph (Exhibit 13-12)

S_0 = 75.4 mph (Exhibit 13-12)

S = 64.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 735 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4264	
	Ramp Volume, V_R: 1757	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4264	0.92	Level	7	0	0.966	1.00	4797
Ramp	1757	0.92	Level	0	0	1.000	1.00	1910
UpStream	735	0.92	Level	0	0	1.000	1.00	799
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = -0.021 using Equation (Exhibit 13-6)

V_{12} = -99 pc/h

V_3 or V_{av34} 2448 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1918 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6707	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3828	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 30.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.451 (Exibit 13-11)

S_R= 57.4 mph (Exhibit 13-11)

S_0= 66.6 mph (Exhibit 13-11)

S = 61.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7794	
	Ramp Volume, V_R: 665	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7794	0.92	Level	7	0	0.966	1.00	8768
Ramp	665	0.92	Level	0	0	1.000	1.00	723
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4231 pc/h

V_3 or V_{av34} 2268 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8768	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	8045	Exhibit 13-8	9600	No
V_R	723	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4231	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.493 (Exhibit 13-12)

S_R = 56.2 mph (Exhibit 13-12)

S_0 = 71.8 mph (Exhibit 13-12)

S = 63.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7129	
	Ramp Volume, V_R: 593	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7129	0.92	Level	7	0	0.966	1.00	8020
Ramp	593	0.92	Level	0	0	1.000	1.00	645
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.137 using Equation (Exhibit 13-6)

V_{12} = 1100 pc/h

V_3 or V_{av34} 3460 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3208 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8665	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3853	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 32.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.470 (Exibit 13-11)

S_R= 56.8 mph (Exhibit 13-11)

S_0= 62.8 mph (Exhibit 13-11)

S = 60.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2016NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7722	
	Ramp Volume, V_R: 489	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7722	0.92	Level	7	0	0.966	1.00	8687
Ramp	489	0.92	Level	0	0	1.000	1.00	532
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.151 using Equation (Exhibit 13-6)

V_{12} = 1314 pc/h

V_3 or V_{av34} 3686 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3474 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9219	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4006	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.486 (Exibit 13-11)

S_R= 56.4 mph (Exhibit 13-11)

S_0= 61.6 mph (Exhibit 13-11)

S = 59.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 8076	
	Ramp Volume, V_R: 1662	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8076	0.92	Level	7	0	0.966	1.00	9085
Ramp	1662	0.92	Level	0	0	1.000	1.00	1807
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 3699 pc/h

V_3 or V_{av34} 2693 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9085	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7278	Exhibit 13-8	9600	No
V_R	1807	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3699	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 24.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.591 (Exhibit 13-12)

S_R = 53.5 mph (Exhibit 13-12)

S_0 = 70.2 mph (Exhibit 13-12)

S = 62.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6414	
	Ramp Volume, V_R: 535	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6414	0.92	Level	7	0	0.966	1.00	7216
Ramp	535	0.92	Level	0	0	1.000	1.00	582
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.145 using Equation (Exhibit 13-6)

V_{12} = 1047 pc/h

V_3 or V_{av34} 3084 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2886 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7798	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3468	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.383 (Exibit 13-11)

S_R= 59.3 mph (Exhibit 13-11)

S_0= 64.0 mph (Exhibit 13-11)

S = 61.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7261	
	Ramp Volume, V_R: 579	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7261	0.92	Level	7	0	0.966	1.00	8169
Ramp	579	0.92	Level	0	0	1.000	1.00	629
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3916 pc/h

V_3 or V_{av34} 2126 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8169	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7540	Exhibit 13-8	9600	No
V_R	629	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3916	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.485 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= 72.4 mph (Exhibit 13-12)

S = 63.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6682	
	Ramp Volume, V_R: 500	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6682	0.92	Level	7	0	0.966	1.00	7517
Ramp	500	0.92	Level	0	0	1.000	1.00	543
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.150 using Equation (Exhibit 13-6)

V_{12} = 1127 pc/h

V_3 or V_{av34} 3195 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3006 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8060	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3549	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.422 (Exibit 13-11)

S_R= 58.2 mph (Exhibit 13-11)

S_0= 63.7 mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7182	
	Ramp Volume, V_R: 300	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7182	0.92	Level	7	0	0.966	1.00	8080
Ramp	300	0.92	Level	0	0	1.000	1.00	326
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.177 using Equation (Exhibit 13-6)

V_{12} = 1431 pc/h

V_3 or V_{av34} 3324 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3232 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8406	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3558	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.409 (Exibit 13-11)

S_R= 58.6 mph (Exhibit 13-11)

S_0= 62.7 mph (Exhibit 13-11)

S = 60.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2016NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 6728	
	Ramp Volume, V_R: 896	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6728	0.92	Level	7	0	0.966	1.00	7569
Ramp	896	0.92	Level	0	0	1.000	1.00	974
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 2689 pc/h

V_3 or V_{av34} 2440 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3027 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7569	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6595	Exhibit 13-8	9600	No
V_R	974	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2689	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 18.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.516 (Exhibit 13-12)

S_R = 55.6 mph (Exhibit 13-12)

S_0 = 71.8 mph (Exhibit 13-12)

S = 64.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 5832	
	Ramp Volume, V_R: 979	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5832	0.92	Level	7	0	0.966	1.00	6561
Ramp	979	0.92	Level	0	0	1.000	1.00	1064
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.085 using Equation (Exhibit 13-6)

V_{12} = 556 pc/h

V_3 or V_{av34} 3002 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2624 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7625	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3688	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 28.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.414 (Exibit 13-11)

S_R= 58.4 mph (Exhibit 13-11)

S_0= 64.7 mph (Exhibit 13-11)

S = 61.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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QUEUING ANALYSIS WORKSHEETS

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB
Directions Served	T	T	T	T	T	L
Maximum Queue (ft)	70	93	93	179	241	324
Average Queue (ft)	40	60	56	124	185	251
95th Queue (ft)	76	101	114	208	282	380
Link Distance (ft)	1028	1028		328	328	649
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			210			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB	WB
Directions Served	T	T	L	T
Maximum Queue (ft)	120	132	144	22
Average Queue (ft)	73	91	90	4
95th Queue (ft)	132	148	163	43
Link Distance (ft)	2251	2251		290
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			360	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	EB	WB	WB	NB	SB
Directions Served	T	T	T	R	R
Maximum Queue (ft)	4	67	77	427	387
Average Queue (ft)	1	13	25	360	386
95th Queue (ft)	9	70	90	539	395
Link Distance (ft)	290	104	104	440	372
Upstream Blk Time (%)		0	0	37	97
Queuing Penalty (veh)		1	3	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 4

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB
Directions Served	T	T	T	T	T	L
Maximum Queue (ft)	140	148	84	119	164	245
Average Queue (ft)	80	99	35	55	93	169
95th Queue (ft)	165	180	93	134	175	260
Link Distance (ft)	1028	1028		328	328	649
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			210			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB	WB
Directions Served	T	T	L	T
Maximum Queue (ft)	264	291	216	89
Average Queue (ft)	190	215	162	18
95th Queue (ft)	296	309	240	107
Link Distance (ft)	2251	2251		290
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			360	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	WB	WB	NB	SB
Directions Served	T	T	R	R
Maximum Queue (ft)	26	53	455	387
Average Queue (ft)	5	15	421	387
95th Queue (ft)	38	62	520	387
Link Distance (ft)	104	104	440	372
Upstream Blk Time (%)		0	56	99
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0

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APPENDIX Q:

INTERIM YEAR (2017) WITH PROJECT HCS2010 FREEWAY SEGMENT, HCS2010 RAMP JUNCTION, AND QUEUING ANALYSIS WORKSHEETS

HCS2010 FREEWAY SEGMENT ANALYSIS WORKSHEETS

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4718*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1327*	pc/h/ln
S	*69.8*	mph
D = v_p / S	*19.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3177*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*894*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*12.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3527*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*992*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*14.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3996*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1124*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5327*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1498*	pc/h/ln
S	*69.0*	mph
D = v_p / S	*21.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbond*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4123*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1160*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5610*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1578*	pc/h/ln
S	*68.3*	mph
D = v_p / S	*23.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4795*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1349*	pc/h/ln
S	*69.7*	mph
D = v_p / S	*19.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3252*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*915*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*13.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3523*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*991*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*14.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4005*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1126*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5141*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1446*	pc/h/ln
S	*69.3*	mph
D = v_p / S	*20.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbond*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4264*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1199*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2017 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6141*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1727*	pc/h/ln
S	*66.8*	mph
D = v_p / S	*25.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2017WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7872*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2214*	pc/h/ln
S	*58.1*	mph
D = v_p / S	*38.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2016WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7202*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2026*	pc/h/ln
S	*62.1*	mph
D = v_p / S	*32.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*West of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2017WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8284*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2330*	pc/h/ln
S	*55.2*	mph
D = v_p / S	*42.2*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2017WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8149*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2292*	pc/h/ln
S	*56.2*	mph
D = v_p / S	*40.8*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*BW Irwindale Off & On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2016WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6487*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1824*	pc/h/ln
S	*65.5*	mph
D = v_p / S	*27.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2017WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7026*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1976*	pc/h/ln
S	*63.0*	mph
D = v_p / S	*31.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2017WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7328*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2061*	pc/h/ln
S	*61.4*	mph
D = v_p / S	*33.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2017WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6744*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1897*	pc/h/ln
S	*64.4*	mph
D = v_p / S	*29.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*West of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2017WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7544*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2122*	pc/h/ln
S	*60.1*	mph
D = v_p / S	*35.3*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2017WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6791*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1910*	pc/h/ln
S	*64.2*	mph
D = v_p / S	*29.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*BW Irwindale Off & On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2017WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5895*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1658*	pc/h/ln
S	*67.6*	mph
D = v_p / S	*24.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*East of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2017WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6879*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1935*	pc/h/ln
S	*63.7*	mph
D = v_p / S	*30.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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HCS2010 RAMP JUNCTION ANALYSIS WORKSHEETS

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 350 veh/h
	Freeway Volume, V_F: 4718	
	Ramp Volume, V_R: 1541	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4718	0.92	Level	7	0	0.966	1.00	5308
Ramp	1541	0.92	Level	0	0	1.000	1.00	1675
UpStream								
DownStream	350	0.92	Level	0	0	1.000	1.00	380

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3259 pc/h

V_3 or V_{av34} 1024 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5308	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	3633	Exhibit 13-8	9600	No
V_R	1675	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3259	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 29.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.579 (Exhibit 13-12)

S_R = 53.8 mph (Exhibit 13-12)

S_0 = 76.7 mph (Exhibit 13-12)

S = 60.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = 1000 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 469 veh/h
	Freeway Volume, V_F: 3177	
	Ramp Volume, V_R: 350	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3177	0.92	Level	7	0	0.966	1.00	3574
Ramp	350	0.92	Level	0	0	1.000	1.00	380
UpStream								
DownStream	469	0.92	Level	0	0	1.000	1.00	510

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.170 using Equation (Exhibit 13-6)

V_{12} = 609 pc/h

V_3 or V_{av34} 1482 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1429 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3954	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1809	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 15.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.296 (Exibit 13-11)

S_R= 61.7 mph (Exhibit 13-11)

S_0= 67.9 mph (Exhibit 13-11)

S = 64.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☑ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1000 ft	Acceleration Lane Length, L_A: 730	L_{down} = ft
V_u = 350 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3527	
	Ramp Volume, V_R: 469	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3527	0.92	Level	7	0	0.966	1.00	3968
Ramp	469	0.92	Level	0	0	1.000	1.00	510
UpStream	350	0.92	Level	0	0	1.000	1.00	380
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.154 using Equation (Exhibit 13-6)

V_{12} = 611 pc/h

V_3 or V_{av34} = 1678 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1587 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4478	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2097	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 17.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.302 (Exibit 13-11)

S_R = 61.6 mph (Exhibit 13-11)

S_0 = 67.5 mph (Exhibit 13-11)

S = 64.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4300 ft
V_u = veh/h	Deceleration Lane Length L_D: 230	V_D = 1487 veh/h
	Freeway Volume, V_F: 5327	
	Ramp Volume, V_R: 1204	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5327	0.92	Level	7	0	0.966	1.00	5993
Ramp	1204	0.92	Level	0	0	1.000	1.00	1309
UpStream								
DownStream	1487	0.92	Level	0	0	1.000	1.00	1616

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3351 pc/h

V_3 or V_{av34} 1321 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5993	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	4684	Exhibit 13-8	9600	No
V_R	1309	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3351	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 31.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.546 (Exhibit 13-12)

S_R = 54.7 mph (Exhibit 13-12)

S_0 = 75.5 mph (Exhibit 13-12)

S = 62.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 1204 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4123	
	Ramp Volume, V_R: 1487	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4123	0.92	Level	7	0	0.966	1.00	4638
Ramp	1487	0.92	Level	0	0	1.000	1.00	1616
UpStream	1204	0.92	Level	0	0	1.000	1.00	1309
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.016 using Equation (Exhibit 13-6)

V_{12} = 73 pc/h

V_3 or V_{av34} 2282 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1855 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6254	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3471	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 27.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.397 (Exibit 13-11)

S_R= 58.9 mph (Exhibit 13-11)

S_0= 66.8 mph (Exhibit 13-11)

S = 62.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 271 veh/h
	Freeway Volume, V_F: 4795	
	Ramp Volume, V_R: 1543	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4795	0.92	Level	7	0	0.966	1.00	5394
Ramp	1543	0.92	Level	0	0	1.000	1.00	1677
UpStream								
DownStream	271	0.92	Level	0	0	1.000	1.00	295

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3298 pc/h

V_3 or V_{av34} 1048 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5394	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	3717	Exhibit 13-8	9600	No
V_R	1677	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3298	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.579 (Exhibit 13-12)

S_R = 53.8 mph (Exhibit 13-12)

S_0 = 76.6 mph (Exhibit 13-12)

S = 60.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = 1000 ft
V_u = veh/h	Deceleration Lane Length L_D	V_D = 482 veh/h
	Freeway Volume, V_F: 3252	
	Ramp Volume, V_R: 271	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3252	0.92	Level	7	0	0.966	1.00	3658
Ramp	271	0.92	Level	0	0	1.000	1.00	295
UpStream								
DownStream	482	0.92	Level	0	0	1.000	1.00	524

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.181 using Equation (Exhibit 13-6)

V_{12} = 662 pc/h

V_3 or V_{av34} 1498 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1463 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3953	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1758	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 14.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.295 (Exibit 13-11)

S_R= 61.8 mph (Exhibit 13-11)

S_0= 67.9 mph (Exhibit 13-11)

S = 65.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☑ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1000 ft	Acceleration Lane Length, L_A: 730	L_{down} = ft
V_u = 271 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3523	
	Ramp Volume, V_R: 482	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3523	0.92	Level	7	0	0.966	1.00	3963
Ramp	482	0.92	Level	0	0	1.000	1.00	524
UpStream	271	0.92	Level	0	0	1.000	1.00	295
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.152 using Equation (Exhibit 13-6)

V_{12} = 604 pc/h

V_3 or V_{av34} 1679 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1585 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4487	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2109	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 17.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.302 (Exibit 13-11)

S_R= 61.5 mph (Exhibit 13-11)

S_0= 67.5 mph (Exhibit 13-11)

S = 64.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4300 ft
V_u = veh/h	Deceleration Lane Length L_D: 230	V_D = 1877 veh/h
	Freeway Volume, V_F: 5141	
	Ramp Volume, V_R: 877	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5141	0.92	Level	7	0	0.966	1.00	5784
Ramp	877	0.92	Level	0	0	1.000	1.00	953
UpStream								
DownStream	1877	0.92	Level	0	0	1.000	1.00	2040

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3059 pc/h

V_3 or V_{av34} 1362 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5784	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	4831	Exhibit 13-8	9600	No
V_R	953	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3059	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.514 (Exhibit 13-12)

S_R = 55.6 mph (Exhibit 13-12)

S_0 = 75.4 mph (Exhibit 13-12)

S = 63.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 877 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4264	
	Ramp Volume, V_R: 1877	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4264	0.92	Level	7	0	0.966	1.00	4797
Ramp	1877	0.92	Level	0	0	1.000	1.00	2040
UpStream	877	0.92	Level	0	0	1.000	1.00	953
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = -0.037 using Equation (Exhibit 13-6)

V_{12} = -177 pc/h

V_3 or V_{av34} 2487 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1918 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6837	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3958	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 31.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.476 (Exibit 13-11)

S_R= 56.7 mph (Exhibit 13-11)

S_0= 66.6 mph (Exhibit 13-11)

S = 60.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7872	
	Ramp Volume, V_R: 670	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7872	0.92	Level	7	0	0.966	1.00	8856
Ramp	670	0.92	Level	0	0	1.000	1.00	728
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4272 pc/h

V_3 or V_{av34} 2292 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8856	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	8128	Exhibit 13-8	9600	No
V_R	728	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4272	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.4 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.494 (Exhibit 13-12)

S_R = 56.2 mph (Exhibit 13-12)

S_0 = 71.8 mph (Exhibit 13-12)

S = 63.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7202	
	Ramp Volume, V_R: 593	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7202	0.92	Level	7	0	0.966	1.00	8102
Ramp	593	0.92	Level	0	0	1.000	1.00	645
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.137 using Equation (Exhibit 13-6)

V_{12} = 1111 pc/h

V_3 or V_{av34} 3495 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3240 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8747	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3885	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 32.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.476 (Exibit 13-11)

S_R= 56.7 mph (Exhibit 13-11)

S_0= 62.7 mph (Exhibit 13-11)

S = 59.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7795	
	Ramp Volume, V_R: 489	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7795	0.92	Level	7	0	0.966	1.00	8769
Ramp	489	0.92	Level	0	0	1.000	1.00	532
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.151 using Equation (Exhibit 13-6)

V_{12} = 1327 pc/h

V_3 or V_{av34} 3721 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3507 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9301	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4039	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 32.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.493 (Exibit 13-11)

S_R= 56.2 mph (Exhibit 13-11)

S_0= 61.5 mph (Exhibit 13-11)

S = 59.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 8149	
	Ramp Volume, V_R: 1662	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8149	0.92	Level	7	0	0.966	1.00	9168
Ramp	1662	0.92	Level	0	0	1.000	1.00	1807
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 3721 pc/h

V_3 or V_{av34} 2723 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = 3768 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9168	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7361	Exhibit 13-8	9600	No
V_R	1807	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3721	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 25.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.591 (Exhibit 13-12)

S_R = 53.5 mph (Exhibit 13-12)

S_0 = 70.2 mph (Exhibit 13-12)

S = 62.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6487	
	Ramp Volume, V_R: 539	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6487	0.92	Level	7	0	0.966	1.00	7298
Ramp	539	0.92	Level	0	0	1.000	1.00	586
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.145 using Equation (Exhibit 13-6)

V_{12} = 1055 pc/h

V_3 or V_{av34} 3121 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2919 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7884	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3505	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.388 (Exibit 13-11)

S_R= 59.1 mph (Exhibit 13-11)

S_0= 63.9 mph (Exhibit 13-11)

S = 61.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7328	
	Ramp Volume, V_R: 584	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7328	0.92	Level	7	0	0.966	1.00	8244
Ramp	584	0.92	Level	0	0	1.000	1.00	635
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3953 pc/h

V_3 or V_{av34} 2145 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8244	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7609	Exhibit 13-8	9600	No
V_R	635	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3953	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.485 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= 72.3 mph (Exhibit 13-12)

S = 63.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6744	
	Ramp Volume, V_R: 500	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6744	0.92	Level	7	0	0.966	1.00	7587
Ramp	500	0.92	Level	0	0	1.000	1.00	543
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.150 using Equation (Exhibit 13-6)

V_{12} = 1137 pc/h

V_3 or V_{av34} 3225 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3034 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8130	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3577	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.425 (Exibit 13-11)

S_R= 58.1 mph (Exhibit 13-11)

S_0= 63.6 mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7244	
	Ramp Volume, V_R: 300	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7244	0.92	Level	7	0	0.966	1.00	8149
Ramp	300	0.92	Level	0	0	1.000	1.00	326
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.177 using Equation (Exhibit 13-6)

V_{12} = 1443 pc/h

V_3 or V_{av34} 3353 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3259 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8475	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3585	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.413 (Exibit 13-11)

S_R= 58.4 mph (Exhibit 13-11)

S_0= 62.6 mph (Exhibit 13-11)

S = 60.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 6791	
	Ramp Volume, V_R: 896	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6791	0.92	Level	7	0	0.966	1.00	7640
Ramp	896	0.92	Level	0	0	1.000	1.00	974
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 2707 pc/h

V_3 or V_{av34} 2466 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3056 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7640	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6666	Exhibit 13-8	9600	No
V_R	974	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2707	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 18.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.516 (Exhibit 13-12)

S_R = 55.6 mph (Exhibit 13-12)

S_0 = 71.8 mph (Exhibit 13-12)

S = 64.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2017WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 5895	
	Ramp Volume, V_R: 984	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5895	0.92	Level	7	0	0.966	1.00	6632
Ramp	984	0.92	Level	0	0	1.000	1.00	1070
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.084 using Equation (Exhibit 13-6)

V_{12} = 557 pc/h

V_3 or V_{av34} 3037 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2652 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7702	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3722	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 28.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.419 (Exibit 13-11)

S_R= 58.3 mph (Exhibit 13-11)

S_0= 64.6 mph (Exhibit 13-11)

S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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QUEUING ANALYSIS WORKSHEETS

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB
Directions Served	T	T	T	T	T	L
Maximum Queue (ft)	102	132	110	300	347	430
Average Queue (ft)	67	95	59	218	279	318
95th Queue (ft)	115	146	122	327	381	470
Link Distance (ft)	1028	1028		328	328	649
Upstream Blk Time (%)				0	3	0
Queuing Penalty (veh)				1	26	0
Storage Bay Dist (ft)			210			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB
Directions Served	T	T	L
Maximum Queue (ft)	108	117	164
Average Queue (ft)	75	82	106
95th Queue (ft)	124	131	182
Link Distance (ft)	2251	2251	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			360
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	EB	WB	WB	NB	SB
Directions Served	T	T	T	R	R
Maximum Queue (ft)	8	15	61	455	387
Average Queue (ft)	2	3	21	427	387
95th Queue (ft)	15	28	67	556	387
Link Distance (ft)	290	104	104	440	372
Upstream Blk Time (%)			0	67	93
Queuing Penalty (veh)			1	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 27

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB
Directions Served	T	T	T	T	T	L
Maximum Queue (ft)	166	179	70	147	183	340
Average Queue (ft)	107	122	39	84	121	239
95th Queue (ft)	190	205	84	161	211	373
Link Distance (ft)	1028	1028		328	328	649
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			210			
Storage Blk Time (%)		0				
Queuing Penalty (veh)		0				

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB	WB	WB
Directions Served	T	T	L	T	T
Maximum Queue (ft)	280	300	224	98	58
Average Queue (ft)	235	248	170	21	12
95th Queue (ft)	322	332	238	119	83
Link Distance (ft)	2251	2251		290	290
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			360		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	WB	NB	SB
Directions Served	T	R	R
Maximum Queue (ft)	20	455	387
Average Queue (ft)	4	454	386
95th Queue (ft)	25	463	386
Link Distance (ft)	104	440	372
Upstream Blk Time (%)		87	97
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

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APPENDIX R:

LONG RANGE (2035) WITHOUT PROJECT HCS2010 FREEWAY SEGMENT, HCS2010 RAMP JUNCTION, AND QUEUING ANALYSIS WORKSHEETS

HCS2010 FREEWAY SEGMENT ANALYSIS WORKSHEETS

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4956*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1394*	pc/h/ln
S	*69.6*	mph
D = v_p / S	*20.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3429*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*964*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*13.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3804*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1070*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4150*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1167*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*North of WB Arrow Hwy*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5576*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1568*	pc/h/ln
S	*68.4*	mph
D = v_p / S	*22.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4452*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1252*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.9*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5937*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1670*	pc/h/ln
S	*67.4*	mph
D = v_p / S	*24.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5025*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1413*	pc/h/ln
S	*69.5*	mph
D = v_p / S	*20.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2035*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3503*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*985*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*14.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3783*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1064*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4152*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1168*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow Hwy*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5388*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1515*	pc/h/ln
S	*68.8*	mph
D = v_p / S	*22.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbond*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4604*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1295*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/13/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6495*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1827*	pc/h/ln
S	*65.4*	mph
D = v_p / S	*27.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8442*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2374*	pc/h/ln
S	*54.0*	mph
D = v_p / S	*44.0*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7751*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2180*	pc/h/ln
S	*58.9*	mph
D = v_p / S	*37.0*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8878*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2497*	pc/h/ln
S	*50.5*	mph
D = v_p / S	*49.5*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8700*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2447*	pc/h/ln
S	*52.0*	mph
D = v_p / S	*47.1*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6969*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1960*	pc/h/ln
S	*63.3*	mph
D = v_p / S	*31.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*East of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7526*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2117*	pc/h/ln
S	*60.2*	mph
D = v_p / S	*35.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7861*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2211*	pc/h/ln
S	*58.1*	mph
D = v_p / S	*38.0*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7259*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2042*	pc/h/ln
S	*61.8*	mph
D = v_p / S	*33.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Westbound*
From/To	*West of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8092*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2276*	pc/h/ln
S	*56.6*	mph
D = v_p / S	*40.2*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
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LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*West of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7286*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2049*	pc/h/ln
S	*61.6*	mph
D = v_p / S	*33.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*BW Irwindale Off & On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6353*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1787*	pc/h/ln
S	*66.0*	mph
D = v_p / S	*27.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*East of Irwindale On Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035NP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7372*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2073*	pc/h/ln
S	*61.2*	mph
D = v_p / S	*33.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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HCS2010 RAMP JUNCTION ANALYSIS WORKSHEETS

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 375 veh/h
	Freeway Volume, V_F: 4956	
	Ramp Volume, V_R: 1527	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4956	0.92	Level	7	0	0.966	1.00	5575
Ramp	1527	0.92	Level	0	0	1.000	1.00	1660
UpStream								
DownStream	375	0.92	Level	0	0	1.000	1.00	408

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3367 pc/h

V_3 or V_{av34} 1104 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5575	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	3915	Exhibit 13-8	9600	No
V_R	1660	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3367	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.577 (Exhibit 13-12)

S_R = 53.8 mph (Exhibit 13-12)

S_0 = 76.4 mph (Exhibit 13-12)

S = 61.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = 1000 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 346 veh/h
	Freeway Volume, V_F: 3429	
	Ramp Volume, V_R: 375	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3429	0.92	Level	7	0	0.966	1.00	3858
Ramp	375	0.92	Level	0	0	1.000	1.00	408
UpStream								
DownStream	346	0.92	Level	0	0	1.000	1.00	376

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.167 using Equation (Exhibit 13-6)

V_{12} = 644 pc/h

V_3 or V_{av34} = 1607 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1543 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4266	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1951	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 16.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.299 (Exibit 13-11)

S_R = 61.6 mph (Exhibit 13-11)

S_0 = 67.6 mph (Exhibit 13-11)

S = 64.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☑ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1000 ft	Acceleration Lane Length, L_A: 730	L_{down} = ft
V_u = 375 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3804	
	Ramp Volume, V_R: 346	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3804	0.92	Level	7	0	0.966	1.00	4279
Ramp	346	0.92	Level	0	0	1.000	1.00	376
UpStream	375	0.92	Level	0	0	1.000	1.00	408
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.171 using Equation (Exhibit 13-6)

V_{12} = 731 pc/h

V_3 or V_{av34} 1774 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1711 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4655	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2087	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 17.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.301 (Exibit 13-11)

S_R= 61.6 mph (Exhibit 13-11)

S_0= 67.2 mph (Exhibit 13-11)

S = 64.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4300 ft
V_u = veh/h	Deceleration Lane Length L_D: 230	V_D = 1485 veh/h
	Freeway Volume, V_F: 5576	
	Ramp Volume, V_R: 1124	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5576	0.92	Level	7	0	0.966	1.00	6273
Ramp	1124	0.92	Level	0	0	1.000	1.00	1222
UpStream								
DownStream	1485	0.92	Level	0	0	1.000	1.00	1614

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R=

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3424 pc/h

V_3 or V_{av34} 1424 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6273	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	5051	Exhibit 13-8	9600	No
V_R	1222	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3424	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 31.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 1124 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4452	
	Ramp Volume, V_R: 1485	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4452	0.92	Level	7	0	0.966	1.00	5008
Ramp	1485	0.92	Level	0	0	1.000	1.00	1614
UpStream	1124	0.92	Level	0	0	1.000	1.00	1222
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.016 using Equation (Exhibit 13-6)

V_{12} = 80 pc/h

V_3 or V_{av34} 2464 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2003 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6622	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3617	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 28.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.417 (Exibit 13-11)

S_R= 58.3 mph (Exhibit 13-11)

S_0= 66.4 mph (Exhibit 13-11)

S = 61.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 280 veh/h
	Freeway Volume, V_F: 5025	
	Ramp Volume, V_R: 1522	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5025	0.92	Level	7	0	0.966	1.00	5653
Ramp	1522	0.92	Level	0	0	1.000	1.00	1654
UpStream								
DownStream	280	0.92	Level	0	0	1.000	1.00	304

Merge Areas | **Diverge Areas**

Estimation of v_{12}

Merge Areas

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3398 pc/h

V_3 or V_{av34} 1127 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Merge Areas

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Diverge Areas

	Actual	Capacity		LOS F?
V_F	5653	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	3999	Exhibit 13-8	9600	No
V_R	1654	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3398	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

Merge Areas

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Diverge Areas

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 31.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

Merge Areas

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

D_s = 0.577 (Exhibit 13-12)

S_R = 53.8 mph (Exhibit 13-12)

S_0 = 76.3 mph (Exhibit 13-12)

S = 61.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = 1000 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 369 veh/h
	Freeway Volume, V_F: 3503	
	Ramp Volume, V_R: 280	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3503	0.92	Level	7	0	0.966	1.00	3941
Ramp	280	0.92	Level	0	0	1.000	1.00	304
UpStream								
DownStream	369	0.92	Level	0	0	1.000	1.00	401

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.180 using Equation (Exhibit 13-6)

V_{12} = 709 pc/h

V_3 or V_{av34} 1616 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1576 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4245	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1880	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 15.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.298 (Exibit 13-11)

S_R= 61.7 mph (Exhibit 13-11)

S_0= 67.5 mph (Exhibit 13-11)

S = 64.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☑ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1000 ft	Acceleration Lane Length, L_A: 730	L_{down} = ft
V_u = 280 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3783	
	Ramp Volume, V_R: 369	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3783	0.92	Level	7	0	0.966	1.00	4256
Ramp	369	0.92	Level	0	0	1.000	1.00	401
UpStream	280	0.92	Level	0	0	1.000	1.00	304
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.168 using Equation (Exhibit 13-6)

V_{12} = 714 pc/h

V_3 or V_{av34} 1771 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1702 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4657	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2103	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 17.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.302 (Exibit 13-11)

S_R= 61.5 mph (Exhibit 13-11)

S_0= 67.2 mph (Exhibit 13-11)

S = 64.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4300 ft
V_u = veh/h	Deceleration Lane Length L_D: 230	V_D = 1891 veh/h
	Freeway Volume, V_F: 5388	
	Ramp Volume, V_R: 784	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5388	0.92	Level	7	0	0.966	1.00	6061
Ramp	784	0.92	Level	0	0	1.000	1.00	852
UpStream								
DownStream	1891	0.92	Level	0	0	1.000	1.00	2055

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3123 pc/h

V_3 or V_{av34} 1469 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6061	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	5209	Exhibit 13-8	9600	No
V_R	852	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3123	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 29.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.505 (Exhibit 13-12)

S_R = 55.9 mph (Exhibit 13-12)

S_0 = 75.0 mph (Exhibit 13-12)

S = 63.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 NP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 784 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4604	
	Ramp Volume, V_R: 1891	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4604	0.92	Level	7	0	0.966	1.00	5179
Ramp	1891	0.92	Level	0	0	1.000	1.00	2055
UpStream	784	0.92	Level	0	0	1.000	1.00	852
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = -0.039 using Equation (Exhibit 13-6)

V_{12} = -201 pc/h

V_3 or V_{av34} = 2690 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2071 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7234	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4126	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 32.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.514 (Exibit 13-11)

S_R = 55.6 mph (Exhibit 13-11)

S_0 = 66.2 mph (Exhibit 13-11)

S = 59.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 8442	
	Ramp Volume, V_R: 691	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8442	0.92	Level	7	0	0.966	1.00	9497
Ramp	691	0.92	Level	0	0	1.000	1.00	751
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4564 pc/h

V_3 or V_{av34} 2466 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9497	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	8746	Exhibit 13-8	9600	No
V_R	751	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4564	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 39.9 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.496 (Exhibit 13-12)

S_R = 56.1 mph (Exhibit 13-12)

S_0 = 71.1 mph (Exhibit 13-12)

S = 63.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7751	
	Ramp Volume, V_R: 617	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7751	0.92	Level	7	0	0.966	1.00	8720
Ramp	617	0.92	Level	0	0	1.000	1.00	671
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.134 using Equation (Exhibit 13-6)

V_{12} = 1168 pc/h

V_3 or V_{av34} 3776 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3488 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9391	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4159	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 34.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.536 (Exibit 13-11)

S_R= 55.0 mph (Exhibit 13-11)

S_0= 61.6 mph (Exhibit 13-11)

S = 58.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 8368	
	Ramp Volume, V_R: 510	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8368	0.92	Level	7	0	0.966	1.00	9414
Ramp	510	0.92	Level	0	0	1.000	1.00	554
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.149 using Equation (Exhibit 13-6)

V_{12} = 1398 pc/h

V_3 or V_{av34} 4008 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 4014 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9968	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4568	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 36.5 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 0.648 (Exibit 13-11)

S_R= 51.9 mph (Exhibit 13-11)

S_0= 61.1 mph (Exhibit 13-11)

S = 56.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 8700	
	Ramp Volume, V_R: 1731	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8700	0.92	Level	7	0	0.966	1.00	9787
Ramp	1731	0.92	Level	0	0	1.000	1.00	1882
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 3937 pc/h

V_3 or V_{av34} 2925 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = 4387 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9787	Exhibit 13-8	9600	Yes
$V_{FO} = V_F - V_R$	7905	Exhibit 13-8	9600	No
V_R	1882	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3937	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.3 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

D_s = 0.597 (Exhibit 13-12)

S_R = 53.3 mph (Exhibit 13-12)

S_0 = 70.2 mph (Exhibit 13-12)

S = 61.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2017WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6969	
	Ramp Volume, V_R: 556	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6969	0.92	Level	7	0	0.966	1.00	7840
Ramp	556	0.92	Level	0	0	1.000	1.00	604
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.142 using Equation (Exhibit 13-6)

V_{12} = 1116 pc/h

V_3 or V_{av34} 3362 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3136 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8444	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3740	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 28.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.422 (Exibit 13-11)

S_R= 58.2 mph (Exhibit 13-11)

S_0= 63.2 mph (Exhibit 13-11)

S = 60.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7861	
	Ramp Volume, V_R: 602	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7861	0.92	Level	7	0	0.966	1.00	8844
Ramp	602	0.92	Level	0	0	1.000	1.00	654
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4225 pc/h

V_3 or V_{av34} 2309 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8844	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	8190	Exhibit 13-8	9600	No
V_R	654	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4225	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.487 (Exhibit 13-12)

S_R = 56.4 mph (Exhibit 13-12)

S_0 = 71.7 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7259	
	Ramp Volume, V_R: 520	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7259	0.92	Level	7	0	0.966	1.00	8166
Ramp	520	0.92	Level	0	0	1.000	1.00	565
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.147 using Equation (Exhibit 13-6)

V_{12} = 1202 pc/h

V_3 or V_{av34} 3482 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3266 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8731	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3831	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 32.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.466 (Exibit 13-11)

S_R= 57.0 mph (Exhibit 13-11)

S_0= 62.6 mph (Exhibit 13-11)

S = 60.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7779	
	Ramp Volume, V_R: 313	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7779	0.92	Level	7	0	0.966	1.00	8751
Ramp	313	0.92	Level	0	0	1.000	1.00	340
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.175 using Equation (Exhibit 13-6)

V_{12} = 1534 pc/h

V_3 or V_{av34} 3608 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3500 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9091	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3840	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 30.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.453 (Exibit 13-11)

S_R= 57.3 mph (Exhibit 13-11)

S_0= 61.5 mph (Exhibit 13-11)

S = 59.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7286	
	Ramp Volume, V_R: 933	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7286	0.92	Level	7	0	0.966	1.00	8197
Ramp	933	0.92	Level	0	0	1.000	1.00	1014
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 2882 pc/h

V_3 or V_{av34} 2657 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3278 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8197	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7183	Exhibit 13-8	9600	No
V_R	1014	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2882	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 20.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.519 (Exhibit 13-12)

S_R = 55.5 mph (Exhibit 13-12)

S_0 = 71.1 mph (Exhibit 13-12)

S = 63.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 NP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6353	
	Ramp Volume, V_R: 1019	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6353	0.92	Level	7	0	0.966	1.00	7147
Ramp	1019	0.92	Level	0	0	1.000	1.00	1108
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.079 using Equation (Exhibit 13-6)

V_{12} = 567 pc/h

V_3 or V_{av34} 3290 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2858 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8255	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3966	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.464 (Exibit 13-11)

S_R= 57.0 mph (Exhibit 13-11)

S_0= 64.1 mph (Exhibit 13-11)

S = 60.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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QUEUING ANALYSIS WORKSHEETS

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB
Directions Served	T	T	T	T	T	L
Maximum Queue (ft)	93	81	92	206	294	402
Average Queue (ft)	49	54	53	142	210	290
95th Queue (ft)	101	97	106	247	309	474
Link Distance (ft)	1028	1028		328	328	649
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)			210			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB	WB
Directions Served	T	T	L	T
Maximum Queue (ft)	100	120	152	20
Average Queue (ft)	69	88	98	4
95th Queue (ft)	117	133	168	39
Link Distance (ft)	2251	2251		290
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			360	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	EB	WB	NB	SB
Directions Served	T	T	R	R
Maximum Queue (ft)	12	33	455	387
Average Queue (ft)	2	13	365	387
95th Queue (ft)	24	46	575	387
Link Distance (ft)	290	104	440	372
Upstream Blk Time (%)			41	96
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB
Directions Served	T	T	T	T	T	L
Maximum Queue (ft)	142	153	72	117	178	263
Average Queue (ft)	88	105	34	64	113	178
95th Queue (ft)	154	174	90	131	197	274
Link Distance (ft)	1028	1028		328	328	649
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			210			
Storage Blk Time (%)		0				
Queuing Penalty (veh)		2				

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB	WB
Directions Served	T	T	L	T
Maximum Queue (ft)	297	316	187	98
Average Queue (ft)	232	249	155	24
95th Queue (ft)	321	344	201	127
Link Distance (ft)	2251	2251		290
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			360	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	EB	WB	NB	SB
Directions Served	T	T	R	R
Maximum Queue (ft)	4	24	455	387
Average Queue (ft)	1	5	454	387
95th Queue (ft)	9	25	461	387
Link Distance (ft)	290	104	440	372
Upstream Blk Time (%)			86	100
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 2

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APPENDIX S:

LONG RANGE (2035) WITH PROJECT HCS2010 FREEWAY SEGMENT, HCS2010 RAMP JUNCTION, AND QUEUING ANALYSIS WORKSHEETS

HCS2010 FREEWAY SEGMENT ANALYSIS WORKSHEETS

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*South of Live Oak Ave*
Date Performed	*6/17/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5078*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1428*	pc/h/ln
S	*69.4*	mph
D = v_p / S	*20.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/13/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3429*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*964*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*13.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3804*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1070*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4300*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1209*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow Hwy*
Date Performed	*6/17/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5733*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1612*	pc/h/ln
S	*68.0*	mph
D = v_p / S	*23.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbond*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4452*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1252*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.9*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6051*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1702*	pc/h/ln
S	*67.1*	mph
D = v_p / S	*25.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5154*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1450*	pc/h/ln
S	*69.3*	mph
D = v_p / S	*20.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Live Oak and EB Arrw Lp On*
Date Performed	*6/17/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3503*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*985*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*14.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*BW EB Arrw Lp On and WB On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3783*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1064*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*North of WB Arrow On*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4293*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1207*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Urban Crossroads*	From/To	*North of WB Arrow Hwy*
Date Performed	*6/17/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5530*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1555*	pc/h/ln
S	*68.5*	mph
D = v_p / S	*22.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbond*
From/To	*BW Arrow Hwy and Live Oak*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4604*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1295*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*6/17/2013*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*South of Live Oak Ave*
Jurisdiction	*Caltrans*
Analysis Year	*2035 WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6615*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1860*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8520*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2396*	pc/h/ln
S	*53.4*	mph
D = v_p / S	*44.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7824*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2200*	pc/h/ln
S	*58.4*	mph
D = v_p / S	*37.7*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8951*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*4*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2517*	pc/h/ln	Design LOS	
S	*49.9*	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
D = v_p / S	*50.5*	pc/mi/ln	S	mph
LOS	*F*		D = v_p / S	pc/mi/ln
			Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*JC*
Agency or Company	*Urban Crossroads*
Date Performed	*08/20/2013*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-210 Eastbound*
From/To	*West of Irwindale Off Ramp*
Jurisdiction	*Caltrans*
Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8773*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2467*	pc/h/ln
S	*51.4*	mph
D = v_p / S	*48.0*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7042*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1981*	pc/h/ln
S	*62.9*	mph
D = v_p / S	*31.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7602*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2138*	pc/h/ln
S	*59.8*	mph
D = v_p / S	*35.8*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7928*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2230*	pc/h/ln
S	*57.7*	mph
D = v_p / S	*38.7*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & Loop OnRamp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7321*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2059*	pc/h/ln
S	*61.4*	mph
D = v_p / S	*33.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Westbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8154*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2293*	pc/h/ln
S	*56.1*	mph
D = v_p / S	*40.8*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*West of Irwindale Off Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7349*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2067*	pc/h/ln
S	*61.3*	mph
D = v_p / S	*33.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*BW Irwindale Off & On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6416*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1804*	pc/h/ln
S	*65.8*	mph
D = v_p / S	*27.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*JC*	Highway/Direction of Travel	*I-210 Eastbound*
Agency or Company	*Urban Crossroads*	From/To	*East of Irwindale On Ramp*
Date Performed	*08/20/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2035WP*

Project Description *Irwindale MRF & Transfer Station TIA (JN 08517)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7440*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2092*	pc/h/ln
S	*60.8*	mph
D = v_p / S	*34.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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HCS2010 RAMP JUNCTION ANALYSIS WORKSHEETS

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 375 veh/h
	Freeway Volume, V_F: 5078	
	Ramp Volume, V_R: 1649	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5078	0.92	Level	7	0	0.966	1.00	5713
Ramp	1649	0.92	Level	0	0	1.000	1.00	1792
UpStream								
DownStream	375	0.92	Level	0	0	1.000	1.00	408

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3502 pc/h

V_3 or V_{av34} 1105 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5713	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	3921	Exhibit 13-8	9600	No
V_R	1792	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3502	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.589 (Exhibit 13-12)

S_R = 53.5 mph (Exhibit 13-12)

S_0 = 76.4 mph (Exhibit 13-12)

S = 60.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = 1000 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 496 veh/h
	Freeway Volume, V_F: 3429	
	Ramp Volume, V_R: 375	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3429	0.92	Level	7	0	0.966	1.00	3858
Ramp	375	0.92	Level	0	0	1.000	1.00	408
UpStream								
DownStream	496	0.92	Level	0	0	1.000	1.00	539

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.167 using Equation (Exhibit 13-6)

V_{12} = 644 pc/h

V_3 or V_{av34} = 1607 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1543 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4266	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1951	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 16.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.299 (Exibit 13-11)

S_R = 61.6 mph (Exhibit 13-11)

S_0 = 67.6 mph (Exhibit 13-11)

S = 64.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	730	☑ No	☐ Off
L_{up} =	1000 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	375 veh/h	Freeway Volume, V_F	3804	V_D =	veh/h
		Ramp Volume, V_R	496		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3804	0.92	Level	7	0	0.966	1.00	4279
Ramp	496	0.92	Level	0	0	1.000	1.00	539
UpStream	375	0.92	Level	0	0	1.000	1.00	408
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.150 using Equation (Exhibit 13-6)

V_{12} = 644 pc/h

V_3 or V_{av34} 1817 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 1711 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4818	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2250	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 18.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.307 (Exibit 13-11)

S_R= 61.4 mph (Exhibit 13-11)

S_0= 67.2 mph (Exhibit 13-11)

S = 64.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4300 ft
V_u = veh/h	Deceleration Lane Length L_D: 230	V_D = 1599 veh/h
	Freeway Volume, V_F: 5733	
	Ramp Volume, V_R: 1281	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5733	0.92	Level	7	0	0.966	1.00	6450
Ramp	1281	0.92	Level	0	0	1.000	1.00	1392
UpStream								
DownStream	1599	0.92	Level	0	0	1.000	1.00	1738

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3597 pc/h

V_3 or V_{av34} 1426 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6450	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	5058	Exhibit 13-8	9600	No
V_R	1392	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3597	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.553 (Exhibit 13-12)

S_R = 54.5 mph (Exhibit 13-12)

S_0 = 75.1 mph (Exhibit 13-12)

S = 62.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 1281 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4452	
	Ramp Volume, V_R: 1599	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4452	0.92	Level	7	0	0.966	1.00	5008
Ramp	1599	0.92	Level	0	0	1.000	1.00	1738
UpStream	1281	0.92	Level	0	0	1.000	1.00	1392
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.001 using Equation (Exhibit 13-6)

V_{12} = 3 pc/h

V_3 or V_{av34} = 2502 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2003 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6746	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3741	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.436 (Exibit 13-11)

S_R = 57.8 mph (Exhibit 13-11)

S_0 = 66.4 mph (Exhibit 13-11)

S = 61.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Live Oak Avenue Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4400 ft
V_u = veh/h	Deceleration Lane Length L_D: 260	V_D = 280 veh/h
	Freeway Volume, V_F: 5154	
	Ramp Volume, V_R: 1651	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5154	0.92	Level	7	0	0.966	1.00	5798
Ramp	1651	0.92	Level	0	0	1.000	1.00	1795
UpStream								
DownStream	280	0.92	Level	0	0	1.000	1.00	304

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3540 pc/h

V_3 or V_{av34} 1129 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5798	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	4003	Exhibit 13-8	9600	No
V_R	1795	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3540	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.590 (Exhibit 13-12)

S_R = 53.5 mph (Exhibit 13-12)

S_0 = 76.3 mph (Exhibit 13-12)

S = 60.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Loop On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = 1000 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 510 veh/h
	Freeway Volume, V_F: 3503	
	Ramp Volume, V_R: 280	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3503	0.92	Level	7	0	0.966	1.00	3941
Ramp	280	0.92	Level	0	0	1.000	1.00	304
UpStream								
DownStream	510	0.92	Level	0	0	1.000	1.00	554

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.180 using Equation (Exhibit 13-6)

V_{12} = 709 pc/h

V_3 or V_{av34} = 1616 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1576 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4245	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1880	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 15.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.298 (Exibit 13-11)

S_R = 61.7 mph (Exhibit 13-11)

S_0 = 67.5 mph (Exhibit 13-11)

S = 64.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Northbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Direct On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☑ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1000 ft	Acceleration Lane Length, L_A: 730	L_{down} = ft
V_u = 280 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3783	
	Ramp Volume, V_R: 510	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3783	0.92	Level	7	0	0.966	1.00	4256
Ramp	510	0.92	Level	0	0	1.000	1.00	554
UpStream	280	0.92	Level	0	0	1.000	1.00	304
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.149 using Equation (Exhibit 13-6)

V_{12} = 632 pc/h

V_3 or V_{av34} = 1812 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1702 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4810	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2256	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 18.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.307 (Exibit 13-11)

S_R = 61.4 mph (Exhibit 13-11)

S_0 = 67.2 mph (Exhibit 13-11)

S = 64.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Arrow Hwy Off Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 4300 ft
V_u = veh/h	Deceleration Lane Length L_D: 230	V_D = 2011 veh/h
	Freeway Volume, V_F: 5530	
	Ramp Volume, V_R: 926	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5530	0.92	Level	7	0	0.966	1.00	6221
Ramp	926	0.92	Level	0	0	1.000	1.00	1007
UpStream								
DownStream	2011	0.92	Level	0	0	1.000	1.00	2186

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3280 pc/h

V_3 or V_{av34} 1470 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6221	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	5214	Exhibit 13-8	9600	No
V_R	1007	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3280	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.519 (Exhibit 13-12)

S_R = 55.5 mph (Exhibit 13-12)

S_0 = 75.0 mph (Exhibit 13-12)

S = 63.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	605 Southbound
Agency or Company	Urban Crossroads	Junction	Live Oak On Ramp
Date Performed	6/17/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description: Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 4300 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 926 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4604	
	Ramp Volume, V_R: 2011	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4604	0.92	Level	7	0	0.966	1.00	5179
Ramp	2011	0.92	Level	0	0	1.000	1.00	2186
UpStream	926	0.92	Level	0	0	1.000	1.00	1007
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = -0.055 using Equation (Exhibit 13-6)

V_{12} = -286 pc/h

V_3 or V_{av34} 2732 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2071 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7365	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4257	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 33.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.547 (Exibit 13-11)

S_R= 54.7 mph (Exhibit 13-11)

S_0= 66.2 mph (Exhibit 13-11)

S = 59.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 8520	
	Ramp Volume, V_R: 696	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8520	0.92	Level	7	0	0.966	1.00	9585
Ramp	696	0.92	Level	0	0	1.000	1.00	757
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4606 pc/h

V_3 or V_{av34} 2489 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9585	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	8828	Exhibit 13-8	9600	No
V_R	757	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4606	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 40.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.496 (Exhibit 13-12)

S_R = 56.1 mph (Exhibit 13-12)

S_0 = 71.0 mph (Exhibit 13-12)

S = 63.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7824	
	Ramp Volume, V_R: 617	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7824	0.92	Level	7	0	0.966	1.00	8802
Ramp	617	0.92	Level	0	0	1.000	1.00	671
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.134 using Equation (Exhibit 13-6)

V_{12} = 1179 pc/h

V_3 or V_{av34} 3811 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3520 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9473	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4191	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 34.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.544 (Exibit 13-11)

S_R= 54.8 mph (Exhibit 13-11)

S_0= 61.4 mph (Exhibit 13-11)

S = 58.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 8441	
	Ramp Volume, V_R: 510	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	8441	0.92	Level	7	0	0.966	1.00	9496
Ramp	510	0.92	Level	0	0	1.000	1.00	554
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.149 using Equation (Exhibit 13-6)

V_{12} = 1411 pc/h

V_3 or V_{av34} 4042 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 4096 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	10050	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4650	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 37.1 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 0.680 (Exibit 13-11)

S_R= 51.0 mph (Exhibit 13-11)

S_0= 61.1 mph (Exhibit 13-11)

S = 55.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 8773	
	Ramp Volume, V_R: 1731	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8773	0.92	Level	7	0	0.966	1.00	9870
Ramp	1731	0.92	Level	0	0	1.000	1.00	1882
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 3959 pc/h

V_3 or V_{av34} 2955 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = 4470 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9870	Exhibit 13-8	9600	Yes
$V_{FO} = V_F - V_R$	7988	Exhibit 13-8	9600	No
V_R	1882	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3959	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 31.0 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

D_s = 0.597 (Exhibit 13-12)

S_R = 53.3 mph (Exhibit 13-12)

S_0 = 70.2 mph (Exhibit 13-12)

S = 61.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7042	
	Ramp Volume, V_R: 560	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7042	0.92	Level	7	0	0.966	1.00	7922
Ramp	560	0.92	Level	0	0	1.000	1.00	609
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.142 using Equation (Exhibit 13-6)

V_{12} = 1122 pc/h

V_3 or V_{av34} 3400 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3168 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8531	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3777	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.428 (Exibit 13-11)

S_R= 58.0 mph (Exhibit 13-11)

S_0= 63.0 mph (Exhibit 13-11)

S = 60.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7928	
	Ramp Volume, V_R: 607	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7928	0.92	Level	7	0	0.966	1.00	8919
Ramp	607	0.92	Level	0	0	1.000	1.00	660
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4261 pc/h

V_3 or V_{av34} 2329 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8919	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	8259	Exhibit 13-8	9600	No
V_R	660	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4261	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.487 (Exhibit 13-12)

S_R = 56.4 mph (Exhibit 13-12)

S_0 = 71.6 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Loop On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7321	
	Ramp Volume, V_R: 520	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7321	0.92	Level	7	0	0.966	1.00	8236
Ramp	520	0.92	Level	0	0	1.000	1.00	565
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.147 using Equation (Exhibit 13-6)

V_{12} = 1212 pc/h

V_3 or V_{av34} 3512 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3294 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8801	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3859	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 32.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.471 (Exibit 13-11)

S_R= 56.8 mph (Exhibit 13-11)

S_0= 62.4 mph (Exhibit 13-11)

S = 59.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Westbound
Agency or Company	Urban Crossroads	Junction	WB Direct On Ramp at Irwindale
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 7841	
	Ramp Volume, V_R: 313	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7841	0.92	Level	7	0	0.966	1.00	8821
Ramp	313	0.92	Level	0	0	1.000	1.00	340
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.175 using Equation (Exhibit 13-6)

V_{12} = 1546 pc/h

V_3 or V_{av34} 3637 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3528 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9161	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3868	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 31.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.459 (Exibit 13-11)

S_R= 57.2 mph (Exhibit 13-11)

S_0= 61.4 mph (Exhibit 13-11)

S = 59.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue Off Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 2	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 400	V_D = veh/h
	Freeway Volume, V_F: 7349	
	Ramp Volume, V_R: 933	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7349	0.92	Level	7	0	0.966	1.00	8268
Ramp	933	0.92	Level	0	0	1.000	1.00	1014
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 2900 pc/h

V_3 or V_{av34} 2684 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3307 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8268	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7254	Exhibit 13-8	9600	No
V_R	1014	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2900	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 21.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.519 (Exhibit 13-12)

S_R = 55.5 mph (Exhibit 13-12)

S_0 = 71.0 mph (Exhibit 13-12)

S = 63.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	JC	Freeway/Dir of Travel	I-210 Eastbound
Agency or Company	Urban Crossroads	Junction	Irwindale Avenue On Ramp
Date Performed	08/20/2013	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2035 WP

Project Description Irwindale MRF & Transfer Station TIA (JN 08517)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 900	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6416	
	Ramp Volume, V_R: 1024	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6416	0.92	Level	7	0	0.966	1.00	7218
Ramp	1024	0.92	Level	0	0	1.000	1.00	1113
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.079 using Equation (Exhibit 13-6)

V_{12} = 568 pc/h

V_3 or V_{av34} 3325 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2887 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8331	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4000	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.471 (Exibit 13-11)

S_R= 56.8 mph (Exhibit 13-11)

S_0= 64.0 mph (Exhibit 13-11)

S = 60.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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QUEUING ANALYSIS WORKSHEETS

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	T	T	T	T	T	L	R
Maximum Queue (ft)	108	128	107	325	369	512	214
Average Queue (ft)	70	94	66	229	298	429	65
95th Queue (ft)	122	150	127	366	420	667	386
Link Distance (ft)	1028	1028		328	328	649	649
Upstream Blk Time (%)				1	7	3	1
Queuing Penalty (veh)				9	73	0	0
Storage Bay Dist (ft)			210				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB
Directions Served	T	T	L
Maximum Queue (ft)	115	118	185
Average Queue (ft)	76	87	135
95th Queue (ft)	130	132	207
Link Distance (ft)	2251	2251	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			360
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	WB	WB	NB	SB
Directions Served	T	T	R	R
Maximum Queue (ft)	38	51	455	387
Average Queue (ft)	10	19	430	387
95th Queue (ft)	61	65	547	387
Link Distance (ft)	104	104	440	372
Upstream Blk Time (%)	0		75	97
Queuing Penalty (veh)	1		0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 83

Intersection: 3: Arrow Hwy. (EW) & I-605 SB Off Ramp (NS)

Movement	EB	EB	EB	WB	WB	SB
Directions Served	T	T	T	T	T	L
Maximum Queue (ft)	192	223	74	165	219	312
Average Queue (ft)	141	149	37	102	141	245
95th Queue (ft)	231	247	86	190	230	346
Link Distance (ft)	1028	1028		328	328	649
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			210			
Storage Blk Time (%)		1				
Queuing Penalty (veh)		7				

Intersection: 7: I-605 SB On Ramp (NS) & Live Oak Av. (EW)

Movement	EB	EB	WB	WB	WB
Directions Served	T	T	L	T	T
Maximum Queue (ft)	334	350	221	89	32
Average Queue (ft)	245	268	169	30	6
95th Queue (ft)	370	386	232	141	64
Link Distance (ft)	2251	2251		290	290
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			360		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: I-605 NB Off-Ramps (NS) & Live Oak Av. (EW)

Movement	WB	NB	SB
Directions Served	T	R	R
Maximum Queue (ft)	7	455	387
Average Queue (ft)	1	455	387
95th Queue (ft)	11	455	387
Link Distance (ft)	104	440	372
Upstream Blk Time (%)		92	98
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 7

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