FEHR PEERS

October 19, 2012

Steve Smith

Director of Planning

SANBAG

1170 W. 3rd Street, 2nd Floor

San Bernardino, CA 92410-1715

Re: 2012 Upland CMP Monitoring

Dear Mr. Smith:

At the request of the City of Upland, Fehr & Peers is pleased to provide this report, which documents traffic counts and Level of Service (LOS) analyses conducted in the City of Upland per the requirements of the San Bernardino County Congestion Management Program (CMP). The traffic counts and LOS analyses were conducted to meet the requirements of CMP Monitoring for the Year 2012, based on the request you provided to the City previously in April 2012. The following locations were analyzed:

1. Central Avenue / Foothill Boulevard
2. Benson Avenue / 16th Street
3. Benson Avenue / Foothill Boulevard
4. Mountain Avenue / 19th Street
5. Mountain Avenue / 8th Street
6. San Antonio Avenue / Foothill Boulevard
7. Euclid Avenue (SR-83) Southbound / Arrow Highway
8. Euclid Avenue (SR-83) Northbound / Arrow Highway
9. Euclid Avenue (SR-83) Southbound / 8th Street
10. Euclid Avenue (SR-83) Northbound / 8th Street

TRAFFIC DATA COLLECTION

Fehr & Peers collected existing traffic counts at the 10 study intersections in August 2012 during the morning (7-9 AM) and evening (4-6 PM) peak hours. Video surveillance was also recorded at each study intersection during the peak hours and was provided to the City for informative purposes. The traffic count data sheets are provided in Appendix A of the attached report.

CMP INTERSECTION LOS

Signalized intersection operations are evaluated using methodologies provided in the 2000 Highway Capacity Manual (HCM) (Transportation Research Board). These methodologies assess average control delays and then assign a corresponding letter grade that represents the overall condition of the intersection. These grades range from level of service (LOS) A (minimal delay) to LOS F (excessive congestion). LOS E represents at-capacity operations. For this study, levels of service are calculated using Synchro 6.0 software, which implements 2000 HCM methodologies. Synchro software allows the input of signal timing and coordination data to more accurately reflect actual conditions.

The following data was input into the LOS analysis:

1. Existing traffic volumes were collected in August 2012.
2. Peak hour factors (PHF) were obtained from the 2012 counts.
3. After reviewing 2010 CMP count data and video surveillance of 2012 CMP locations, a 2% truck percentage was used
4. The following saturation flow rates were applied:
    a. 1800 for exclusive through and exclusive right turn lanes
    b. 1700 for exclusive left turn lanes
    c. 1600 for dual left turn lanes
5. Existing signal timing data was provided by City staff.

As shown in Table 2 of our report, all of the intersections analyzed in this analysis were determined to be operating at LOS D or better. Output sheets from our Synchro analysis are provided in Appendix B of the attached report.

FEHR & PEERS

We hope you find this information helpful. If you have any questions, comments, or requests for additional information, please contact me at 714-941-8800 or by email at j.pack@fehrandpeers.com.

Sincerely,
FEHR & PEERS

Jason D. Pack
Senior Associate

REGISTERED PROFESSIONAL ENGINEER
JASON D. PACK
No. TR2402
Exp: 6/30/2013
TRAFFIC
STATE OF CALIFORNIA

CC: Paul Baum, City of Upland

Attachments

FEHR & PEERS

MEMORANDUM

Date: October 19, 2012

To: Paul Baum
Associate Engineer
City of Upland
460 North Euclid Avenue
Upland, CA 91786

From: Chris Gray
Thao Pham

Subject: City of Upland 2012 Annual CMP Monitoring Report

OC11-0187 Task 6-8

Fehr & Peers has completed the 2012 Congestion Management Program (CMP) Monitoring Report for the City of Upland, to be incorporated into the San Bernardino CMP. Traffic operations were evaluated for 10 intersections identified by the San Bernardino Associated Governments (SANBAG). This document reports the results of the operations analysis in support of the continual traffic monitoring efforts.

The remainder of this memorandum is divided into the following sections: Summary, Traffic Operations Methodologies and Assumptions, Study Area, Data Collection, and Traffic Operations Analysis.

SUMMARY

Ten CMP intersections in the City of Upland were analyzed for the 2012 CMP Monitoring Report. All of the intersections operate acceptably at LOS D or better during and morning and evening peak hours.

TRAFFIC OPERATIONS METHODOLOGIES AND ASSUMPTIONS

Intersection Analysis

Signalized intersection operations are evaluated using methodologies provided in the 2000 Highway Capacity Manual (HCM) (Transportation Research Board). These methodologies assess average control delays and then assign a corresponding letter grade that represents the overall condition of the intersection. These grades range from level of service (LOS) A (minimal delay) to LOS F (excessive congestion). LOS E represents at-capacity operations. For this study, levels of service are calculated using Synchro 6.0 software, which implements 2000 HCM methodologies. Synchro software allows the input of signal timing and coordination data to more accurately reflect actual conditions. Descriptions of the LOS letter grades for signalized intersections are provided in Table 1.

Table 1 also documents the relationship between the various volume-to-capacity (V/C) ratios, delay, and LOS for signalized intersections. Please note that V/C ratios are provided as they are used in the impact assessment based on requirements set forth by the San Bernardino County Congestion Management Program (CMP).

The City of Upland strives to maintain a minimum LOS D at City intersections. For CMP intersections, a V/C ratio of 1.0 or greater is considered to be LOS F, regardless of intersection delay LOS. The following traffic analysis input parameters, in consistency with *San Bernardino County CMP, 2005 Update Appendix C – Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County,* were utilized in evaluating the study intersections for the City of Upland:

1. Existing traffic volumes were collected in 2012.
2. Peak hour factors (PHF) were obtained from the 2012 counts.
3. After reviewing 2010 CMP count data and video surveillance of 2012 CMP locations, a 2% truck percentage was assumed
4. The following saturation flow rates were applied:
    a. 1800 for exclusive through and exclusive right turn lanes

b. 1700 for exclusive left turn lanes
c. 1600 for dual left turn lanes

5. Existing signal timing data was provided by City staff.

TABLE 1
SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	V/C Ratio	Delay (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	0.000-0.600	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	0.601-0.700	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	0.701-0.800	> 20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	0.801-0.900	> 35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	0.901-1.000	> 55.0 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 1.000	> 80.0

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

STUDY AREA

The City of Upland lies in San Bernardino County, approximately 35 miles east of Los Angeles, in the foothills of the San Gabriel Mountains. The City of Upland is surrounded by of the City of Rancho Cucamonga to the east, La Verne and Claremont to the west, and the cities of Ontario and Montclair to the south. Major highways such as Interstate 10, Interstate 15, California Highway 60 and State Route 210 provide a high level of regional accessibility to the City of Upland.

Traffic operations are evaluated for the following 10 CMP intersections identified by SANBAG, shown on Figure 1.

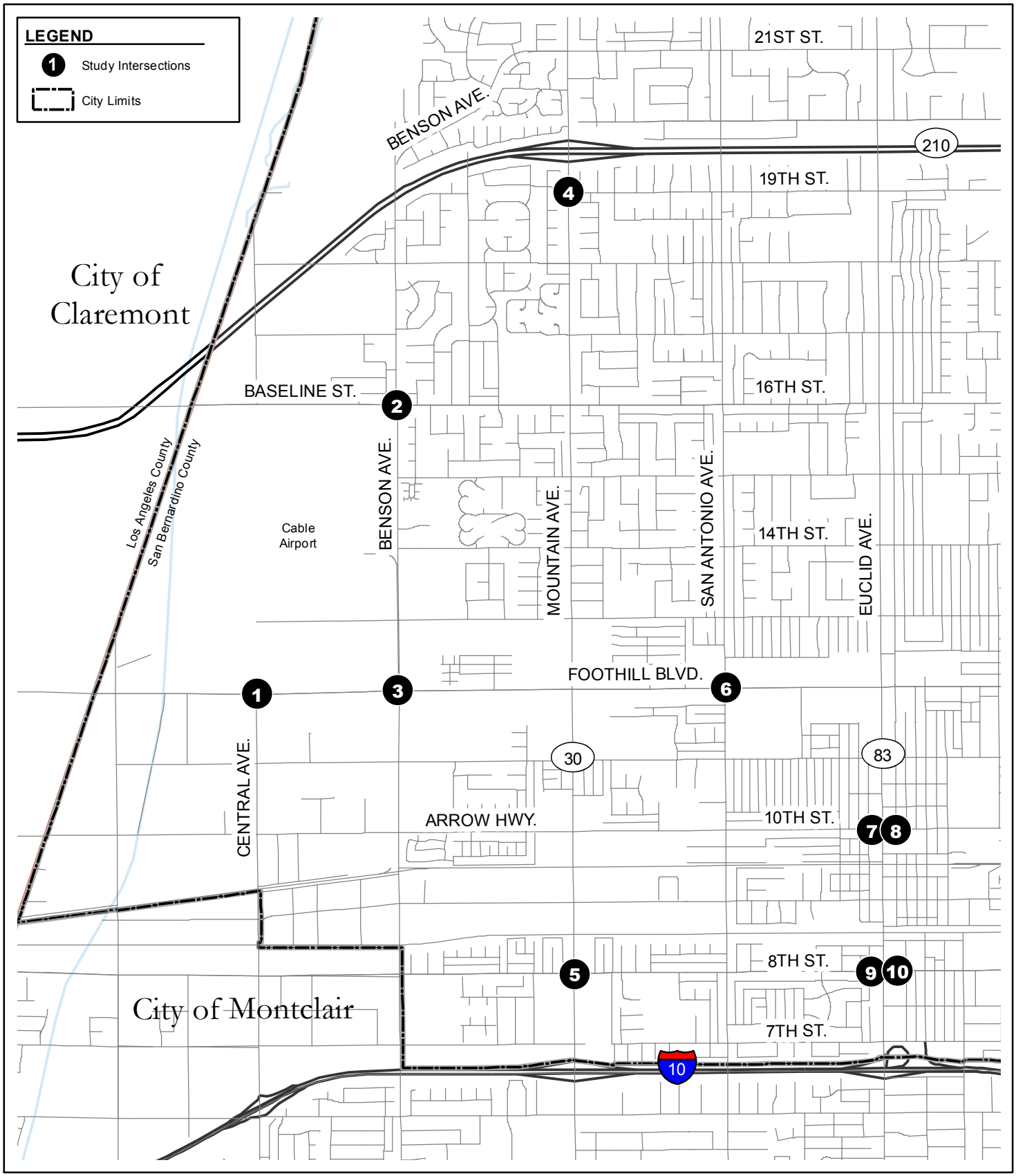
1. Central Avenue / Foothill Boulevard
2. Benson Avenue / 16th Street
3. Benson Avenue / Foothill Boulevard
4. Mountain Avenue / 19th Street
5. Mountain Avenue / 8th Street
6. San Antonio Avenue / Foothill Boulevard
7. Euclid Avenue (SR-83) Southbound / Arrow Highway
8. Euclid Avenue (SR-83) Northbound / Arrow Highway
9. Euclid Avenue (SR-83) Southbound / 8th Street
10. Euclid Avenue (SR-83) Northbound / 8th Street

DATA COLLECTION

Fehr & Peers collected existing traffic counts at the 10 study intersections in August 2012 during the morning (7-9 AM) and evening (4-6 PM) peak hours. Video surveillance was also recorded at each study intersection during the peak hours and is provided to the City for informative purposes. Truck classification counts were not required as part of the 2012 CMP monitoring effort. However, after review of traffic count information from the 2010 CMP report and video surveillance of 2012 CMP locations, it was assumed that applying a 2% truck percentage would represent a conservative truck density within the study area. Year 2012 lane configurations and peak hour traffic volumes are represented on Figure 2. Traffic counts for the study intersections are provided in Appendix A.

TRAFFIC OPERATIONS ANALYSIS

Existing AM and PM peak hour LOS results for the 10 study intersections are summarized in Table 2 and also shown on Figure 3. The detailed LOS calculations are provided in Appendix B. As shown in Table 2, all of the intersections operate acceptably at LOS D or better in Year 2012.



FEHR PEERS

2012 CMP ANALYSIS LOCATIONS

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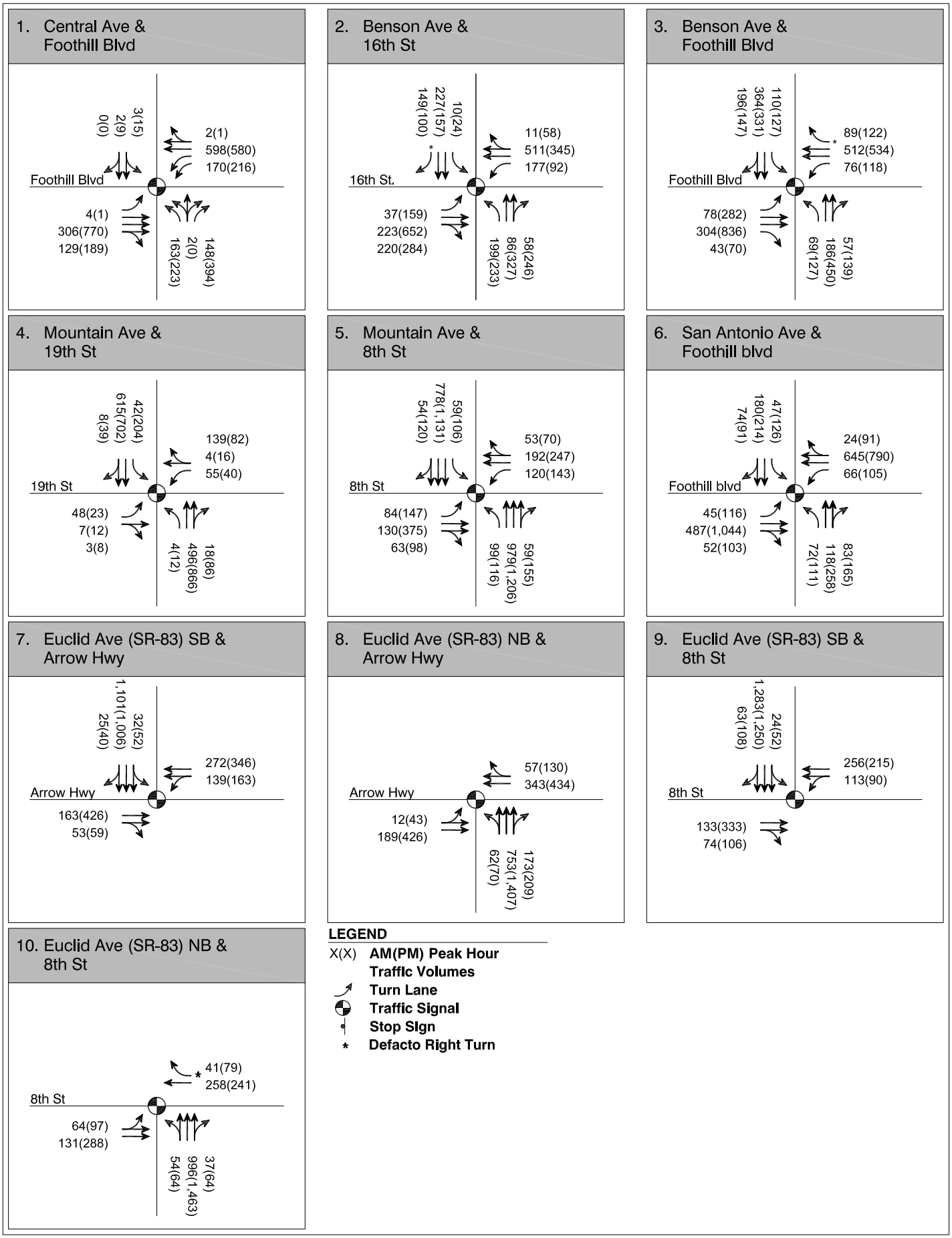
FIGURE 1



2012 LANE CONFIGURATIONS AND PEAK HOUR TRAFFIC VOLUMES

FEHR & PEERS

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FIGURE 2

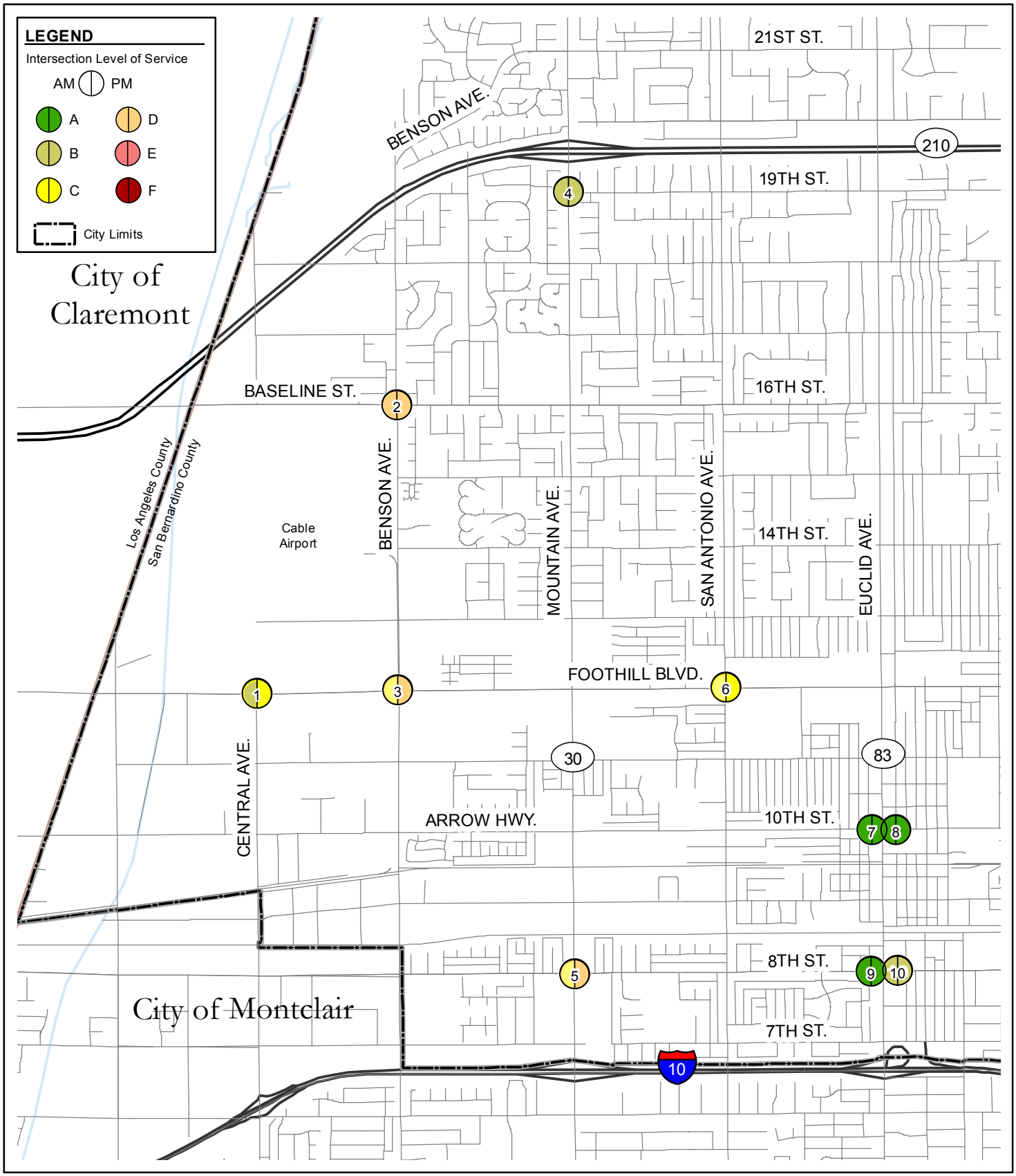
TABLE 2

INTERSECTION LEVELS OF SERVICE – 2012 CONDITIONS

Intersection	Control	Level of Service			
		Peak Hour	V/C Ratio[1]	Delay[2]	LOS
1. Central Avenue / Foothill Boulevard	Signalized	AM	0.38	15.9	B
		PM	0.50	21.5	C
2. Benson Avenue / 16th Street	Signalized	AM	0.55	53.3	D
		PM	0.68	40.1	D
3. Benson Avenue / Foothill Boulevard	Signalized	AM	0.57	30.9	C
		PM	0.76	40.2	D
4. Mountain Avenue / 19th Street	Signalized	AM	0.37	11.6	B
		PM	0.65	16.4	B
5. Mountain Avenue / 8th Street (Arrow Highway)	Signalized	AM	0.58	24.2	C
		PM	0.71	35.7	D
6. San Antonio Avenue / Foothill Boulevard	Signalized	AM	0.43	20.9	C
		PM	0.72	25.3	C
7. Euclid Avenue (SR-83) Southbound / Arrow Highway	Signalized	AM	0.53	9.6	A
		PM	0.60	9.4	A
8. Euclid Avenue (SR-83) Northbound / Arrow Highway	Signalized	AM	0.41	5.0	A
		PM	0.70	9.1	A
9. Euclid Avenue (SR-83) Southbound / 8th Street	Signalized	AM	0.60	8.0	A
		PM	0.57	9.0	A
10. Euclid Avenue (SR-83) Northbound / 8th Street	Signalized	AM	0.58	10.5	B
		PM	0.64	14.8	B

Notes:
1. V/C = Volume/Capacity ratio.
2. Delay is reported in seconds.

Source: Fehr & Peers, 2012



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2012 CMP

LEVEL OF SERVICE PERFORMANCE

FIGURE 3

Appendix A

2012 CMP Count Data

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_004 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

AM

NS/EW Streets:	Central Ave			Central Ave			Foothill Blvd			Foothill Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	29	0	20	0	0		0	37	17	41	104	0	248
7:15 AM	40	0	24	0	0		0	49	15	42	165	0	335
7:30 AM	38	0	33	1	0		2	65	29	60	169	0	397
7:45 AM	51	0	40	0	1		0	81	41	40	174	0	428
8:00 AM	38	0	38	1	0		0	82	29	36	128	0	352
8:15 AM	36	2	37	1	1		2	78	30	34	127	2	350
8:30 AM	37	0	36	2	0		1	81	17	39	98	1	312
8:45 AM	27	0	32	0	1		0	92	37	54	139	0	382
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	296	2	260	5	3	0	5	565	215	346	1104	3	2804
APPROACH %'s :	53.05%	0.36%	46.59%	62.50%	37.50%	0.00%	0.64%	71.97%	27.39%	23.81%	75.98%	0.21%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	163	2	148	3	2	0	4	306	129	170	598	2	1527
PEAK HR FACTOR :		0.860			0.625			0.900			0.841		0.892

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_004 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

PM

NS/EW Streets:	Central Ave			Central Ave			Foothill Blvd			Foothill Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	63		101	1	0		0	167	53	62	135	1	583
4:15 PM	40		98	4	1		0	165	52	53	130	0	543
4:30 PM	36		81	3	4		0	177	40	59	137	0	537
4:45 PM	45		83	6	1		1	166	49	46	153	0	550
5:00 PM	72		112	3	3		0	206	64	65	163	0	688
5:15 PM	47		94	2	2		0	202	40	56	127	1	571
5:30 PM	59		105	4	3		0	196	36	49	137	0	589
5:45 PM	55		91	0	2		0	165	39	48	144	0	544
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	417	0	765	23	16	0	1	1444	373	438	1126	2	4605
APPROACH %'s :	35.28%	0.00%	64.72%	58.97%	41.03%	0.00%	0.06%	79.43%	20.52%	27.97%	71.90%	0.13%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	223	0	394	15	9	0	1	770	189	216	580	1	2398
PEAK HR FACTOR :		0.838			0.857			0.889			0.874		0.871

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_002 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

AM

NS/EW Streets:	Benson Ave			Benson Ave			16th St			16th St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	63	15	12	3	47	39	7	37	29	37	123	2	414
7:15 AM	55	15	15	2	55	36	7	34	37	33	146	3	438
7:30 AM	58	18	11	3	51	46	7	61	47	63	122	4	491
7:45 AM	37	28	14	2	66	32	13	75	78	45	140	2	532
8:00 AM	49	25	18	3	55	35	10	53	58	36	103	2	447
8:15 AM	37	17	8	5	42	34	6	57	52	39	111	3	411
8:30 AM	47	17	14	4	36	49	17	60	52	41	82	1	420
8:45 AM	45	26	18	2	47	40	14	60	56	53	107	2	470
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	391	161	110	24	399	311	81	437	409	347	934	19	3623
APPROACH %'s :	59.06%	24.32%	16.62%	3.27%	54.36%	42.37%	8.74%	47.14%	44.12%	26.69%	71.85%	1.46%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	199	86	58	10	227	149	37	223	220	177	511	11	1908
PEAK HR FACTOR :		0.932			0.965			0.723			0.925		0.897

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_002 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

PM

NS/EW Streets:	Benson Ave			Benson Ave			16th St			16th St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	30	74	57	4	35	34	34	106	60	31	53	13	531
4:15 PM	41	65	66	2	34	21	32	116	51	24	66	10	528
4:30 PM	42	81	54	2	41	28	43	136	70	27	88	10	622
4:45 PM	50	86	50	4	55	23	34	135	53	26	73	10	599
5:00 PM	80	99	65	3	53	29	14	187	74	10	87	25	726
5:15 PM	59	79	67	8	30	26	28	187	63	14	90	14	665
5:30 PM	46	80	57	9	37	22	65	133	76	40	80	11	656
5:45 PM	48	69	57	4	37	23	52	145	71	28	88	8	630
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	396	633	473	36	322	206	302	1145	518	200	625	101	4957
APPROACH %'s :	26.36%	42.14%	31.49%	6.38%	57.09%	36.52%	15.37%	58.27%	26.36%	21.60%	67.49%	10.91%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	233	327	246	24	157	100	159	652	284	92	345	58	2677
PEAK HR FACTOR :		0.826			0.826			0.985			0.945		0.922

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_003 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

AM

NS/EW Streets:	Benson Ave			Benson Ave			Foothill Blvd			Foothill Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	16	48	9	17	63	36	8	39	3	18	107	24	388
7:15 AM	19	41	15	17	76	42	11	47	5	16	130	16	435
7:30 AM	14	49	7	21	79	63	16	64	9	14	156	18	510
7:45 AM	21	50	16	33	106	55	26	73	7	27	132	31	577
8:00 AM	17	46	23	24	99	41	20	90	17	18	123	18	536
8:15 AM	17	41	11	32	80	37	16	77	10	17	101	22	461
8:30 AM	23	45	15	23	76	48	29	64	13	22	90	16	464
8:45 AM	16	59	24	36	102	54	15	88	9	23	111	30	567
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	143	379	120	203	681	376	141	542	73	155	950	175	3938
APPROACH %'s :	22.27%	59.03%	18.69%	16.11%	54.05%	29.84%	18.65%	71.69%	9.66%	12.11%	74.22%	13.67%	

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	69	186	57	110	364	196	78	304	43	76	512	89	2084
PEAK HR FACTOR :		0.897			0.863			0.837			0.891		0.903

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_003 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

PM

NS/EW Streets:	Benson Ave			Benson Ave			Foothill Blvd			Foothill Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	30	103	31	34	82	38	54	173	22	24	131	19	741
4:15 PM	22	102	36	28	77	30	49	183	16	25	115	30	713
4:30 PM	30	109	34	33	109	36	66	183	17	29	153	35	834
4:45 PM	33	103	30	34	83	40	71	180	22	34	124	23	777
5:00 PM	34	118	42	29	86	40	64	233	14	29	156	27	872
5:15 PM	32	124	28	32	65	27	77	208	13	28	122	27	783
5:30 PM	28	105	39	32	97	40	70	215	21	27	132	45	851
5:45 PM	31	103	38	33	76	46	56	164	21	28	121	23	740
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	240	867	278	255	675	297	507	1539	146	224	1054	229	6311
APPROACH %'s :	17.33%	62.60%	20.07%	20.78%	55.01%	24.21%	23.13%	70.21%	6.66%	14.86%	69.94%	15.20%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	127	450	139	127	331	147	282	836	70	118	534	122	3283
PEAK HR FACTOR :		0.923			0.895			0.955			0.913		0.941

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_009 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

AM

NS/EW Streets:	Mountain Ave			Mountain Ave			19th St			19th St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	2	143	4	12	128	2	13	0	1	8	0	41	354
7:15 AM	1	124	6	5	119	3	13	1	2	16	1	33	324
7:30 AM	0	109	4	16	176	1	10	6	0	20	2	42	386
7:45 AM	1	120	4	9	192	2	12	0	0	11	1	23	375
8:00 AM	0	115	4	14	148	2	8	0	0	11	1	26	329
8:15 AM	0	110	5	17	167	3	10	0	2	12	0	21	347
8:30 AM	0	117	6	9	187	4	12	0	3	9	0	18	365
8:45 AM	0	118	6	9	187	7	9	1	1	11	2	21	372
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	4	956	39	91	1304	24	87	8	9	98	7	225	2852
APPROACH %'s :	0.40%	95.70%	3.90%	6.41%	91.90%	1.69%	83.65%	7.69%	8.65%	29.70%	2.12%	68.18%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	4	496	18	42	615	8	48	7	3	55	4	139	1439
PEAK HR FACTOR :		0.869			0.819			0.906			0.773		0.932

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_009 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

PM

NS/EW Streets:	Mountain Ave			Mountain Ave			19th St			19th St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	0	169	10	18	154	6	5	2	2	14	4	11	395
4:15 PM	4	187	19	36	164	12	5	2	0	11	4	16	460
4:30 PM	0	228	21	31	177	10	5	3	1	12	2	13	503
4:45 PM	4	191	14	30	175	10	11	5	3	15	2	17	477
5:00 PM	2	222	16	30	155	6	5	3	3	10	4	24	480
5:15 PM	6	269	29	51	177	10	5	3	2	14	8	19	593
5:30 PM	1	186	23	63	194	14	7	3	1	10	2	21	525
5:45 PM	3	189	18	60	176	9	6	3	2	6	2	18	492
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	20	1641	150	319	1372	77	49	24	14	92	28	139	3925
APPROACH %'s :	1.10%	90.61%	8.28%	18.04%	77.60%	4.36%	56.32%	27.59%	16.09%	35.52%	10.81%	53.67%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	12	866	86	204	702	39	23	12	8	40	16	82	2090
PEAK HR FACTOR :		0.793			0.872			0.977			0.841		0.881

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_001 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

AM

NS/EW Streets:	Mountain Ave			Mountain Ave			8th St/Arrow Hwy			8th St/Arrow Hwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	30	121	8	7	194	15	8	22	15	37	55	6	518
7:15 AM	21	150	15	9	218	9	7	21	19	38	62	15	584
7:30 AM	30	159	6	10	206	11	15	34	16	48	72	9	616
7:45 AM	30	276	12	12	216	13	22	29	23	36	67	15	751
8:00 AM	16	237	20	8	202	12	13	22	11	41	49	8	639
8:15 AM	36	237	17	17	159	9	21	34	10	18	40	18	616
8:30 AM	17	229	10	22	201	20	28	45	19	25	36	12	664
8:45 AM	19	257	12	10	174	17	21	37	13	30	53	20	663
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	199	1666	100	95	1570	106	135	244	126	273	434	103	5051
APPROACH %'s :	10.13%	84.78%	5.09%	5.36%	88.65%	5.99%	26.73%	48.32%	24.95%	33.70%	53.58%	12.72%	
PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	99	979	59	59	778	54	84	130	63	120	192	53	2670
PEAK HR FACTOR :		0.894			0.917			0.753			0.773		0.889

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_001 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

PM

NS/EW Streets:	Mountain Ave			Mountain Ave			8th St/Arrow Hwy			8th St/Arrow Hwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	31	290	37	26	245	21	40	72	19	36	53	17	887
4:15 PM	35	287	38	28	235	24	38	94	20	34	63	18	914
4:30 PM	40	295	34	33	238	28	32	83	23	38	60	22	926
4:45 PM	33	298	44	24	264	24	34	84	24	32	70	14	945
5:00 PM	26	286	30	26	338	39	34	89	23	40	63	18	1012
5:15 PM	24	305	38	30	293	27	43	112	27	37	66	19	1021
5:30 PM	33	317	43	26	236	30	36	90	24	34	48	19	936
5:45 PM	30	297	40	27	226	27	37	88	15	41	45	19	892
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	252	2375	304	220	2075	220	294	712	175	292	468	146	7533
APPROACH %'s :	8.60%	81.03%	10.37%	8.75%	82.50%	8.75%	24.89%	60.29%	14.82%	32.23%	51.66%	16.11%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	116	1206	155	106	1131	120	147	375	98	143	247	70	3914
PEAK HR FACTOR :		0.940			0.842			0.852			0.943		0.958

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_010 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

AM

NS/EW Streets:	San Antonio Ave			San Antonio Ave			Foothill Blvd			Foothill Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	5	14	9	5	24	7	5	51	6	7	121	8	262
7:15 AM	8	16	16	9	34	18	4	79	9	11	172	7	383
7:30 AM	13	32	11	12	37	28	8	81	23	6	165	4	420
7:45 AM	10	24	22	11	48	13	14	105	19	21	198	4	489
8:00 AM	13	34	22	12	59	20	10	120	16	17	161	9	493
8:15 AM	17	22	20	16	43	18	13	110	16	19	155	4	453
8:30 AM	14	29	19	10	41	18	9	108	15	11	153	3	430
8:45 AM	28	33	22	9	37	18	13	149	5	19	176	8	517
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	108	204	141	84	323	140	76	803	109	111	1301	47	3447
APPROACH %'s :	23.84%	45.03%	31.13%	15.36%	59.05%	25.59%	7.69%	81.28%	11.03%	7.61%	89.17%	3.22%	
PEAK HR START TIME :	800 AM												TOTAL
PEAK HR VOL :	72	118	83	47	180	74	45	487	52	66	645	24	1893
PEAK HR FACTOR :		0.822			0.827			0.874			0.905		0.915

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_010 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

PM

NS/EW Streets:	San Antonio Ave			San Antonio Ave			Foothill Blvd			Foothill Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	33	75	36	32	42	17	21	221	13	20	168	20	698
4:15 PM	45	70	35	16	54	15	24	208	23	31	218	21	760
4:30 PM	30	62	30	20	47	16	26	238	21	21	211	28	750
4:45 PM	33	61	34	30	40	16	34	223	26	24	199	21	741
5:00 PM	24	60	41	25	50	29	29	261	29	24	218	18	808
5:15 PM	26	58	33	27	44	19	24	290	20	25	198	25	789
5:30 PM	35	62	51	37	46	24	33	256	28	29	182	25	808
5:45 PM	26	78	40	37	74	19	30	237	26	27	192	23	809
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	252	526	300	224	397	155	221	1934	186	201	1586	181	6163
APPROACH %'s :	23.38%	48.79%	27.83%	28.87%	51.16%	19.97%	9.44%	82.61%	7.95%	10.21%	80.59%	9.20%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	111	258	165	126	214	91	116	1044	103	105	790	91	3214
PEAK HR FACTOR :		0.902			0.829			0.945			0.948		0.993

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_005 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

AM

NS/EW Streets:	Euclid SB			Euclid SB			Arrow Hwy			Arrow Hwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM				6	237	6		28	16	29	42		364
7:15 AM				6	273	4		29	10	43	52		417
7:30 AM				9	286	6		46	14	40	60		461
7:45 AM				11	252	5		50	11	22	84		435
8:00 AM				6	290	10		38	18	34	76		472
8:15 AM				10	263	9		30	7	32	57		408
8:30 AM				14	219	6		43	4	29	71		386
8:45 AM				8	214	10		52	15	24	54		377
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	70	2034	56	0	316	95	253	496	0	3320
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	3.24%	94.17%	2.59%	0.00%	76.89%	23.11%	33.78%	66.22%	0.00%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	0	0	0	32	1101	25	0	163	53	139	272	0	1785
PEAK HR FACTOR :		0.000			0.946			0.885			0.934		0.945

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_005 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

PM

NS/EW Streets:	Euclid SB			Euclid SB			Arrow Hwy			Arrow Hwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM				21	227	9		78	18	39	93		485
4:15 PM				15	253	10		79	13	33	78		481
4:30 PM				15	219	11		77	12	39	92		465
4:45 PM				18	231	14		99	16	31	76		485
5:00 PM				9	250	14		123	15	48	86		545
5:15 PM				18	233	8		110	12	42	92		515
5:30 PM				10	273	11		105	21	39	82		541
5:45 PM				15	250	7		88	11	34	86		491
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	121	1936	84	0	759	118	305	685	0	4008
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	5.65%	90.43%	3.92%	0.00%	86.55%	13.45%	30.81%	69.19%	0.00%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	0	52	1006	40	0	426	59	163	346	0	2092
PEAK HR FACTOR :		0.000			0.934			0.879			0.950		0.960

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_006 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

AM

NS/EW Streets:	Euclid NB			Euclid NB			Arrow Hwy			Arrow Hwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	6	150	25				3	31			65	5	285
7:15 AM	7	137	26				7	28			88	14	307
7:30 AM	7	154	32				5	49			92	7	346
7:45 AM	17	196	48				1	61			90	14	427
8:00 AM	13	177	39				3	43			97	9	381
8:15 AM	12	197	52				3	35			77	15	391
8:30 AM	20	183	34				5	50			79	19	390
8:45 AM	8	199	51				4	58			71	18	409
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	90	1393	307	0	0	0	31	355	0	0	659	101	2936
APPROACH %'s :	5.03%	77.82%	17.15%	#DIV/0!	#DIV/0!	#DIV/0!	8.03%	91.97%	0.00%	0.00%	86.71%	13.29%	
PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	62	753	173	0	0	0	12	189	0	0	343	57	1589
PEAK HR FACTOR :		0.946			0.000			0.810			0.943		0.930

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_006 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

PM

NS/EW Streets:	Euclid NB			Euclid NB			Arrow Hwy			Arrow Hwy			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	16	261	43				15	83			116	18	552
4:15 PM	17	291	48				10	85			96	18	565
4:30 PM	24	369	47				11	79			105	24	659
4:45 PM	12	299	56				13	106			95	37	618
5:00 PM	18	360	51				12	116			114	43	714
5:15 PM	16	379	55				7	125			120	26	728
5:30 PM	13	327	43				12	103			108	24	630
5:45 PM	22	317	56				15	88			98	21	617
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	138	2603	399	0	0	0	95	785	0	0	852	211	5083
APPROACH %'s :	4.39%	82.90%	12.71%	#DIV/0!	#DIV/0!	#DIV/0!	10.80%	89.20%	0.00%	0.00%	80.15%	19.85%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	70	1407	209	0	0	0	43	426	0	0	434	130	2719
PEAK HR FACTOR :		0.937			0.000			0.888			0.898		0.934

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_007 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

AM

NS/EW Streets:	Euclid SB			Euclid SB			8th St			8th St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM				1	277	11		25	21	19	56		410
7:15 AM				7	341	11		18	16	25	59		477
7:30 AM				7	351	12		43	20	35	55		523
7:45 AM				2	287	23		39	18	39	73		481
8:00 AM				8	304	17		33	20	14	69		465
8:15 AM				5	289	15		46	17	18	45		435
8:30 AM				9	243	9		52	26	15	40		394
8:45 AM				6	254	18		36	7	18	48		387
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	45	2346	116	0	292	145	183	445	0	3572
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	1.79%	93.58%	4.63%	0.00%	66.82%	33.18%	29.14%	70.86%	0.00%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	0	0	0	24	1283	63	0	133	74	113	256	0	1946
PEAK HR FACTOR :		0.000			0.926			0.821			0.824		0.930

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_007 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

PM

NS/EW Streets:	Euclid SB			Euclid SB			8th St			8th St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM				12	280	33		55	29	25	51		485
4:15 PM				19	261	16		77	23	11	52		459
4:30 PM				7	278	18		90	18	24	48		483
4:45 PM				10	280	29		83	20	19	68		509
5:00 PM				15	331	18		88	34	25	61		572
5:15 PM				12	290	31		79	29	27	52		520
5:30 PM				11	335	27		92	18	20	38		541
5:45 PM				14	294	32		74	25	18	64		521
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	100	2349	204	0	638	196	169	434	0	4090
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	3.77%	88.54%	7.69%	0.00%	76.50%	23.50%	28.03%	71.97%	0.00%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	0	52	1250	108	0	333	106	90	215	0	2154
PEAK HR FACTOR :		0.000			0.945			0.900			0.887		0.941

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_008 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

AM

NS/EW Streets:	Euclid NB			Euclid NB			8th St			8th St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
7:00 AM	19	190	3				6	20			51	4	293
7:15 AM	23	182	17				10	15			66	7	320
7:30 AM	19	193	11				6	43			71	7	350
7:45 AM	19	269	20				13	29			93	12	455
8:00 AM	14	240	8				12	28			71	12	385
8:15 AM	12	253	5				16	36			49	10	381
8:30 AM	9	234	4				23	38			45	7	360
8:45 AM	14	234	5				12	30			53	16	364
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	129	1795	73	0	0	0	98	239	0	0	499	75	2908
APPROACH %'s :	6.46%	89.88%	3.66%	#DIV/0!	#DIV/0!	#DIV/0!	29.08%	70.92%	0.00%	0.00%	86.93%	13.07%	
PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	54	996	37	0	0	0	64	131	0	0	258	41	1581
PEAK HR FACTOR :		0.882			0.000			0.799			0.712		0.869

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_6116_008 **Day:** THURSDAY

City: City of Upland **Date:** 8/23/2012

PM

NS/EW Streets:	Euclid NB			Euclid NB			8th St			8th St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
4:00 PM	16	323	19				18	49			60	16	501
4:15 PM	15	327	20				36	59			48	17	522
4:30 PM	12	346	15				33	65			59	19	549
4:45 PM	19	334	22				28	65			69	17	554
5:00 PM	20	352	11				23	81			69	8	564
5:15 PM	15	403	16				25	65			61	23	608
5:30 PM	11	357	12				30	73			49	33	565
5:45 PM	18	351	25				19	69			62	15	559
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	126	2793	140	0	0	0	212	526	0	0	477	148	4422
APPROACH %'s :	4.12%	91.30%	4.58%	#DIV/0!	#DIV/0!	#DIV/0!	28.73%	71.27%	0.00%	0.00%	76.32%	23.68%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	64	1463	64	0	0	0	97	288	0	0	241	79	2296
PEAK HR FACTOR :		0.916			0.000			0.925			0.952		0.944

CONTROL : Signalized

Appendix B

2012 CMP Level of Service Results

HCM Signalized Intersection Capacity Analysis
1: Foothill Blvd & Central Avenue

8/31/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1900	1600	1800	1900	1700	1800	1800	1800	1800	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91		0.97	0.95		0.95	0.91	0.95		0.95	
Frt	1.00	0.96		1.00	1.00		1.00	1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.95	1.00		0.97	
Satd. Flow (prot)	1583	4604		2891	3352		1504	1531	1425		3251	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.95	1.00		0.97	
Satd. Flow (perm)	1583	4604		2891	3352		1504	1531	1425		3251	
Volume (vph)	4	306	129	170	598	2	163	2	148	3	2	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.84	0.84	0.84	0.86	0.86	0.86	0.63	0.63	0.63
Adj. Flow (vph)	4	340	143	202	712	2	190	2	172	5	3	0
RTOR Reduction (vph)	0	45	0	0	0	0	0	0	128	0	0	0
Lane Group Flow (vph)	4	438	0	202	714	0	95	97	44	0	8	0
Turn Type	Prot			Prot			Split		pm+ov	Split		
Protected Phases	5	2		1	6		8	8	1	7	7	
Permitted Phases									8			
Actuated Green, G (s)	5.9	55.8		13.2	63.1		11.5	11.5	24.7		1.3	
Effective Green, g (s)	5.9	57.1		13.2	64.4		12.4	12.4	25.6		1.3	
Actuated g/C Ratio	0.06	0.57		0.13	0.64		0.12	0.12	0.26		0.01	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.9	4.9	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	93	2629		382	2159		186	190	422		42	
v/s Ratio Prot	0.00	0.10		c0.07	c0.21		0.06	c0.06	0.01		c0.00	
v/s Ratio Perm									0.02			
v/c Ratio	0.04	0.17		0.53	0.33		0.51	0.51	0.10		0.19	
Uniform Delay, d1	44.4	10.2		40.5	8.1		41.0	41.0	28.4		48.8	
Progression Factor	1.18	0.57		0.72	0.91		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.2	0.1		1.2	0.4		2.4	2.3	0.1		2.2	
Delay (s)	52.4	5.9		30.4	7.7		43.3	43.3	28.5		51.0	
Level of Service	D	A		C	A		D	D	C		D	
Approach Delay (s)		6.3			12.7			36.3			51.0	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.8%	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												
Ideal Flow (vphpl)	1700	1800	1900	1700	1800	1900	1700	1800	1900	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.93		1.00	1.00		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	3103		1583	3342		1583	3150		1583	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1583	3103		1583	3342		1583	3150		1583	3353	1500
Volume (vph)	37	223	220	177	511	11	199	86	58	10	227	149
Peak-hour factor, PHF	0.72	0.72	0.72	0.93	0.93	0.93	0.93	0.93	0.93	0.97	0.97	0.97
Adj. Flow (vph)	51	310	306	190	549	12	214	92	62	10	234	154
RTOR Reduction (vph)	0	105	0	0	1	0	0	29	0	0	0	94
Lane Group Flow (vph)	51	511	0	190	560	0	214	125	0	10	234	60
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	8.4	26.9		21.7	40.2		23.5	74.2		2.7	53.4	53.4
Effective Green, g (s)	7.9	27.4		21.2	40.7		23.0	76.2		2.2	55.4	55.4
Actuated g/C Ratio	0.06	0.19		0.15	0.28		0.16	0.53		0.02	0.39	0.39
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	6.0		3.5	6.0	6.0
Vehicle Extension (s)	3.0	2.0		3.0	2.0		3.0	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)	87	595		235	951		255	1679		24	1299	581
v/s Ratio Prot	0.03	c0.16		c0.12	0.17		c0.14	0.04		0.01	c0.07	
v/s Ratio Perm												0.04
v/c Ratio	0.59	0.86		0.81	0.59		0.84	0.07		0.42	0.18	0.10
Uniform Delay, d1	66.0	55.9		58.9	44.0		58.2	16.2		69.8	28.8	27.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.7	11.4		18.2	0.6		20.8	0.1		11.3	0.3	0.4
Delay (s)	75.6	67.3		77.1	44.6		79.0	16.3		81.1	29.1	28.3
Level of Service	E	E		E	D		E	B		F	C	C
Approach Delay (s)		67.9			52.8			52.8			30.1	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM Average Control Delay	53.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	143.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	57.2%	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												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1900	1700	1800	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3353	1500	1583	3353	1500	1583	3236		1583	3177	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3353	1500	1583	3353	1500	1583	3236		1583	3177	
Volume (vph)	78	304	43	76	512	89	69	186	57	110	364	196
Peak-hour factor, PHF	0.84	0.84	0.84	0.89	0.89	0.89	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	93	362	51	85	575	100	77	207	63	128	423	228
RTOR Reduction (vph)	0	0	32	0	0	57	0	34	0	0	81	0
Lane Group Flow (vph)	93	362	19	85	575	43	77	236	0	128	570	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	8.9	36.6	36.6	13.7	41.4	41.4	8.1	19.6		11.5	23.0	
Effective Green, g (s)	8.9	37.9	37.9	13.7	42.7	42.7	8.1	20.9		11.5	24.3	
Actuated g/C Ratio	0.09	0.38	0.38	0.14	0.43	0.43	0.08	0.21		0.12	0.24	
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5	2.5	3.0	2.5	2.5	2.0	2.5		2.0	3.0	
Lane Grp Cap (vph)	141	1271	569	217	1432	641	128	676		182	772	
v/s Ratio Prot	c0.06	0.11		0.05	c0.17		0.05	0.07		c0.08	c0.18	
v/s Ratio Perm			0.01			0.03						
v/c Ratio	0.66	0.28	0.03	0.39	0.40	0.07	0.60	0.35		0.70	0.74	
Uniform Delay, d1	44.1	21.6	19.5	39.4	19.8	16.9	44.4	33.7		42.6	34.9	
Progression Factor	1.01	1.28	1.93	0.77	0.66	0.89	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.1	0.6	0.1	0.9	0.6	0.1	5.4	0.2		9.6	3.7	
Delay (s)	52.8	28.2	37.8	31.1	13.7	15.1	49.8	34.0		52.2	38.6	
Level of Service	D	C	D	C	B	B	D	C		D	D	
Approach Delay (s)		33.7			15.8			37.5			40.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	30.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.6%	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												
Ideal Flow (vphpl)	1700	1800	1900	1700	1800	1900	1700	1800	1900	1700	1800	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1693		1583	1507		1583	3335		1583	3346	
Flt Permitted	0.43	1.00		0.75	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	725	1693		1251	1507		1583	3335		1583	3346	
Volume (vph)	48	7	3	55	4	139	4	496	18	42	615	8
Peak-hour factor, PHF	0.91	0.91	0.91	0.77	0.77	0.77	0.87	0.87	0.87	0.82	0.82	0.82
Adj. Flow (vph)	53	8	3	71	5	181	5	570	21	51	750	10
RTOR Reduction (vph)	0	3	0	0	154	0	0	2	0	0	1	0
Lane Group Flow (vph)	53	8	0	71	32	0	5	589	0	51	759	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	11.6	11.6		12.1	12.1		1.1	50.4		5.0	54.3	
Effective Green, g (s)	12.1	12.1		12.1	12.1		0.6	51.9		4.5	55.8	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.01	0.64		0.06	0.69	
Clearance Time (s)	4.5	4.5		4.0	4.0		3.5	5.5		3.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	109	254		188	227		12	2150		88	2319	
v/s Ratio Prot		0.00			0.02		0.00	0.18		c0.03	c0.23	
v/s Ratio Perm	c0.07			0.06								
v/c Ratio	0.49	0.03		0.38	0.14		0.42	0.27		0.58	0.33	
Uniform Delay, d1	31.4	29.2		30.8	29.7		39.8	6.2		37.1	4.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.0		0.5	0.1		8.3	0.3		5.6	0.4	
Delay (s)	32.6	29.2		31.3	29.8		48.1	6.5		42.7	5.3	
Level of Service	C	C		C	C		D	A		D	A	
Approach Delay (s)		32.0			30.2			6.8			7.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	80.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.3%	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												
Ideal Flow (vphpl)	1700	1800	1900	1700	1800	1900	1700	1800	1900	1700	1800	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frt	1.00	0.95		1.00	0.97		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3189		1583	3244		1583	4777		1583	4771	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3189		1583	3244		1583	4777		1583	4771	
Volume (vph)	84	130	63	120	192	53	99	979	59	59	778	54
Peak-hour factor, PHF	0.75	0.75	0.75	0.77	0.77	0.77	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	112	173	84	156	249	69	111	1100	66	64	846	59
RTOR Reduction (vph)	0	42	0	0	15	0	0	3	0	0	5	0
Lane Group Flow (vph)	112	215	0	156	303	0	111	1163	0	64	900	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.3	14.7		10.5	15.9		9.2	32.6		5.5	28.9	
Effective Green, g (s)	9.3	14.7		10.5	15.9		9.2	32.6		5.5	28.9	
Actuated g/C Ratio	0.12	0.19		0.13	0.20		0.12	0.41		0.07	0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	186	591		210	650		184	1964		110	1739	
v/s Ratio Prot	0.07	0.07		c0.10	c0.09		c0.07	c0.24		0.04	0.19	
v/s Ratio Perm												
v/c Ratio	0.60	0.36		0.74	0.47		0.60	0.59		0.58	0.52	
Uniform Delay, d1	33.2	28.2		33.1	28.0		33.3	18.2		35.8	19.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	0.4		13.2	0.5		5.5	0.5		7.6	0.3	
Delay (s)	38.6	28.6		46.3	28.5		38.8	18.7		43.4	20.0	
Level of Service	D	C		D	C		D	B		D	C	
Approach Delay (s)		31.6			34.4			20.4			21.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	79.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.7%	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												
Ideal Flow (vphpl)	1700	1800	1900	1700	1800	1900	1700	1800	1900	1700	1800	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3304		1583	3335		1583	3146		1583	3207	
Flt Permitted	0.95	1.00		0.95	1.00		0.36	1.00		0.52	1.00	
Satd. Flow (perm)	1583	3304		1583	3335		608	3146		873	3207	
Volume (vph)	45	487	52	66	645	24	72	118	83	47	180	74
Peak-hour factor, PHF	0.87	0.87	0.87	0.91	0.91	0.91	0.82	0.82	0.82	0.83	0.83	0.83
Adj. Flow (vph)	52	560	60	73	709	26	88	144	101	57	217	89
RTOR Reduction (vph)	0	6	0	0	2	0	0	86	0	0	54	0
Lane Group Flow (vph)	52	614	0	73	733	0	88	159	0	57	252	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8			4		
Actuated Green, G (s)	6.6	49.4		13.5	56.6		21.0	14.2		19.4	13.4	
Effective Green, g (s)	6.6	50.7		13.5	57.6		20.6	14.8		19.0	14.0	
Actuated g/C Ratio	0.07	0.51		0.14	0.58		0.21	0.15		0.19	0.14	
Clearance Time (s)	4.0	5.3		4.0	5.0		3.0	4.6		3.0	4.6	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	4.0		2.0	2.0	
Lane Grp Cap (vph)	104	1675		214	1921		182	466		201	449	
v/s Ratio Prot	c0.03	0.19		0.05	c0.22		c0.03	0.05		0.01	c0.08	
v/s Ratio Perm							0.07			0.04		
v/c Ratio	0.50	0.37		0.34	0.38		0.48	0.34		0.28	0.56	
Uniform Delay, d1	45.1	14.9		39.2	11.5		33.5	38.2		34.0	40.1	
Progression Factor	1.21	0.81		0.67	0.69		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.5		0.2	0.1		0.7	0.6		0.3	1.0	
Delay (s)	55.8	12.5		26.4	8.0		34.3	38.8		34.3	41.1	
Level of Service	E	B		C	A		C	D		C	D	
Approach Delay (s)		15.9			9.6			37.6			40.0	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM Average Control Delay	20.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.3%	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												
Ideal Flow (vphpl)	1900	1800	1900	1900	1800	1900	1900	1900	1900	1900	1800	1900
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		0.95			0.95						0.91	
Frt		0.96			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		3229			3297						4796	
Flt Permitted		1.00			0.77						1.00	
Satd. Flow (perm)		3229			2598						4796	
Volume (vph)	0	163	53	139	272	0	0	0	0	32	1101	25
Peak-hour factor, PHF	0.89	0.89	0.89	0.93	0.93	0.93	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	183	60	149	292	0	0	0	0	34	1159	26
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	230	0	0	441	0	0	0	0	0	1214	0
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		16.0			16.0						16.0	
Effective Green, g (s)		16.0			16.0						16.0	
Actuated g/C Ratio		0.40			0.40						0.40	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		1292			1039						1918	
v/s Ratio Prot		0.07										
v/s Ratio Perm					c0.17						0.25	
v/c Ratio		0.18			0.42						0.63	
Uniform Delay, d1		7.8			8.7						9.6	
Progression Factor		1.00			0.53						1.00	
Incremental Delay, d2		0.3			1.2						1.6	
Delay (s)		8.1			5.9						11.2	
Level of Service		A			A						B	
Approach Delay (s)		8.1			5.9			0.0			11.2	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.5%	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												
Ideal Flow (vphpl)	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		0.95			0.95			0.91				
Frt		1.00			0.98			0.97				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		3343			3281			4677				
Flt Permitted		0.93			1.00			1.00				
Satd. Flow (perm)		3105			3281			4677				
Volume (vph)	12	189	0	0	343	57	62	753	173	0	0	0
Peak-hour factor, PHF	0.81	0.81	0.81	0.94	0.94	0.94	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	15	233	0	0	365	61	65	793	182	0	0	0
RTOR Reduction (vph)	0	0	0	0	34	0	0	82	0	0	0	0
Lane Group Flow (vph)	0	248	0	0	392	0	0	958	0	0	0	0
Turn Type	Perm						Perm					
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)		16.0			16.0			16.0				
Effective Green, g (s)		16.0			16.0			16.0				
Actuated g/C Ratio		0.40			0.40			0.40				
Clearance Time (s)		4.0			4.0			4.0				
Lane Grp Cap (vph)		1242			1312			1871				
v/s Ratio Prot					c0.12							
v/s Ratio Perm		0.08						0.20				
v/c Ratio		0.20			0.30			0.51				
Uniform Delay, d1		7.8			8.2			9.1				
Progression Factor		0.58			1.00			0.29				
Incremental Delay, d2		0.4			0.6			0.8				
Delay (s)		4.9			8.8			3.4				
Level of Service		A			A			A				
Approach Delay (s)		4.9			8.8			3.4			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	5.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.5%	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												
Ideal Flow (vphpl)	1900	1800	1900	1900	1800	1900	1900	1900	1900	1900	1800	1900
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		0.95			0.95						0.91	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		3173			3302						4780	
Flt Permitted		1.00			0.79						1.00	
Satd. Flow (perm)		3173			2639						4780	
Volume (vph)	0	133	74	113	256	0	0	0	0	24	1283	63
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	0	162	90	138	312	0	0	0	0	26	1380	68
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	247	0	0	450	0	0	0	0	0	1461	0
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		16.0			16.0						16.0	
Effective Green, g (s)		16.0			16.0						16.0	
Actuated g/C Ratio		0.40			0.40						0.40	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		1269			1056						1912	
v/s Ratio Prot		0.08										
v/s Ratio Perm					c0.17						0.31	
v/c Ratio		0.19			0.43						0.76	
Uniform Delay, d1		7.8			8.7						10.4	
Progression Factor		1.00			0.41						0.63	
Incremental Delay, d2		0.3			1.1						2.5	
Delay (s)		8.1			4.7						9.1	
Level of Service		A			A						A	
Approach Delay (s)		8.1			4.7			0.0			9.1	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.5%	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												
Ideal Flow (vphpl)	1900	1800	1900	1900	1800	1800	1900	1800	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		0.95			1.00	1.00		0.91				
Frt		1.00			1.00	0.85		0.99				
Flt Protected		0.98			1.00	1.00		1.00				
Satd. Flow (prot)		3299			1765	1500		4781				
Flt Permitted		0.79			1.00	1.00		1.00				
Satd. Flow (perm)		2640			1765	1500		4781				
Volume (vph)	64	131	0	0	258	41	54	996	37	0	0	0
Peak-hour factor, PHF	0.80	0.80	0.80	0.71	0.71	0.71	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	80	164	0	0	363	58	61	1132	42	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	14	0	9	0	0	0	0
Lane Group Flow (vph)	0	244	0	0	363	44	0	1226	0	0	0	0
Turn Type	Perm					Perm	Perm					
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Actuated Green, G (s)		16.0			16.0	16.0		16.0				
Effective Green, g (s)		16.0			16.0	16.0		16.0				
Actuated g/C Ratio		0.40			0.40	0.40		0.40				
Clearance Time (s)		4.0			4.0	4.0		4.0				
Lane Grp Cap (vph)		1056			706	600		1912				
v/s Ratio Prot					c0.21							
v/s Ratio Perm		0.09				0.03		0.26				
v/c Ratio		0.23			0.51	0.07		0.64				
Uniform Delay, d1		7.9			9.1	7.4		9.7				
Progression Factor		0.54			1.00	1.00		1.00				
Incremental Delay, d2		0.5			2.7	0.2		1.7				
Delay (s)		4.8			11.7	7.7		11.3				
Level of Service		A			B	A		B				
Approach Delay (s)		4.8			11.2			11.3			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.5%	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												
Ideal Flow (vphpl)	1700	1800	1900	1600	1800	1000	1700	1800	1800	1900	1800	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91		0.97	0.95		0.95	0.91	0.95		0.95	
Frt	1.00	0.97		1.00	1.00		1.00	0.95	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00		0.97	
Satd. Flow (prot)	1583	4675		2891	3352		1504	1474	1425		3251	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.97	1.00		0.97	
Satd. Flow (perm)	1583	4675		2891	3352		1504	1474	1425		3251	
Volume (vph)	1	770	189	216	580	1	223	0	394	15	9	0
Peak-hour factor, PHF	0.89	0.89	0.89	0.87	0.87	0.87	0.84	0.84	0.84	0.86	0.86	0.86
Adj. Flow (vph)	1	865	212	248	667	1	265	0	469	17	10	0
RTOR Reduction (vph)	0	27	0	0	0	0	0	19	291	0	0	0
Lane Group Flow (vph)	1	1050	0	248	668	0	149	159	116	0	27	0
Turn Type	Prot			Prot			Split		pm+ov	Split		
Protected Phases	5	2		1	6		8	8	1	7	7	
Permitted Phases									8			
Actuated Green, G (s)	5.5	54.1		14.2	62.8		16.3	16.3	30.5		7.2	
Effective Green, g (s)	5.5	55.4		14.2	64.1		17.2	17.2	31.4		7.2	
Actuated g/C Ratio	0.05	0.50		0.13	0.58		0.16	0.16	0.29		0.07	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.9	4.9	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	79	2355		373	1953		235	230	459		213	
v/s Ratio Prot	0.00	c0.22		c0.09	0.20		0.10	c0.11	0.03		c0.01	
v/s Ratio Perm									0.05			
v/c Ratio	0.01	0.45		0.66	0.34		0.63	0.69	0.25		0.13	
Uniform Delay, d1	49.7	17.5		45.6	12.0		43.5	43.9	30.3		48.4	
Progression Factor	1.39	0.45		1.25	0.54		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.1	0.5		3.2	0.3		5.5	8.7	0.3		0.3	
Delay (s)	69.3	8.4		60.4	6.9		48.9	52.6	30.6		48.7	
Level of Service	E	A		E	A		D	D	C		D	
Approach Delay (s)		8.5			21.4			39.6			48.7	
Approach LOS		A			C			D			D	

Intersection Summary			
HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.9%	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												
Ideal Flow (vphpl)	1700	1800	1900	1700	1800	1900	1700	1800	1900	1700	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.95		1.00	0.98		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	3200		1583	3281		1583	3137		1583	3353	1500
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1583	3200		1583	3281		1583	3137		1583	3353	1500
Volume (vph)	159	652	284	92	345	58	233	327	246	24	157	100
Peak-hour factor, PHF	0.99	0.99	0.99	0.95	0.95	0.95	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	161	659	287	97	363	61	281	394	296	29	189	120
RTOR Reduction (vph)	0	20	0	0	6	0	0	64	0	0	0	104
Lane Group Flow (vph)	161	926	0	97	418	0	281	626	0	29	189	16
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	17.7	45.3		12.8	40.4		34.6	44.4		5.2	14.5	14.5
Effective Green, g (s)	17.2	45.8		12.3	40.9		34.1	46.4		4.7	17.0	17.0
Actuated g/C Ratio	0.14	0.37		0.10	0.33		0.27	0.37		0.04	0.14	0.14
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	6.0		3.5	6.5	6.5
Vehicle Extension (s)	3.0	2.0		3.0	2.0		3.0	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)	217	1171		156	1072		431	1163		59	455	204
v/s Ratio Prot	c0.10	c0.29		0.06	0.13		c0.18	c0.20		0.02	0.06	
v/s Ratio Perm												0.01
v/c Ratio	0.74	0.79		0.62	0.39		0.65	0.54		0.49	0.42	0.08
Uniform Delay, d1	51.9	35.4		54.2	32.5		40.3	31.0		59.1	49.5	47.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.8	3.5		7.5	0.1		3.5	0.2		6.3	0.2	0.1
Delay (s)	64.7	38.9		61.7	32.6		43.8	31.2		65.4	49.8	47.3
Level of Service	E	D		E	C		D	C		E	D	D
Approach Delay (s)		42.7			38.0			34.9			50.2	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM Average Control Delay	40.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	125.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.7%	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												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1900	1700	1800	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3353	1500	1583	3353	1500	1583	3234		1583	3199	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3353	1500	1583	3353	1500	1583	3234		1583	3199	
Volume (vph)	282	836	70	118	534	122	127	450	139	127	331	147
Peak-hour factor, PHF	0.96	0.96	0.96	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	294	871	73	130	587	134	138	489	151	141	368	163
RTOR Reduction (vph)	0	0	50	0	0	102	0	26	0	0	46	0
Lane Group Flow (vph)	294	871	23	130	587	32	138	614	0	141	485	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	21.1	34.0	34.0	12.4	25.3	25.3	11.2	33.1		11.9	33.8	
Effective Green, g (s)	21.1	35.3	35.3	12.4	26.6	26.6	11.2	34.4		11.9	35.1	
Actuated g/C Ratio	0.19	0.32	0.32	0.11	0.24	0.24	0.10	0.31		0.11	0.32	
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5	2.5	3.0	2.5	2.5	2.0	2.5		2.0	3.0	
Lane Grp Cap (vph)	304	1076	481	178	811	363	161	1011		171	1021	
v/s Ratio Prot	c0.19	c0.26		0.08	0.18		0.09	c0.19		c0.09	0.15	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	0.97	0.81	0.05	0.73	0.72	0.09	0.86	0.61		0.82	0.48	
Uniform Delay, d1	44.1	34.3	25.8	47.2	38.3	32.3	48.6	32.1		48.0	30.1	
Progression Factor	1.05	0.74	0.57	1.45	0.60	0.62	1.00	1.00		1.00	1.00	
Incremental Delay, d2	39.3	5.9	0.2	10.3	3.9	0.3	32.5	2.7		25.3	0.4	
Delay (s)	85.7	31.2	14.9	78.7	26.8	20.4	81.1	34.8		73.4	30.4	
Level of Service	F	C	B	E	C	C	F	C		E	C	
Approach Delay (s)		43.2			33.8			43.0			39.4	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	40.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.1%	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												
Ideal Flow (vphpl)	1700	1800	1900	1700	1800	1900	1700	1800	1900	1700	1800	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.87		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1659		1583	1543		1583	3307		1583	3326	
Flt Permitted	0.63	1.00		0.74	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1052	1659		1241	1543		1583	3307		1583	3326	
Volume (vph)	23	12	8	40	16	82	12	866	86	204	702	39
Peak-hour factor, PHF	0.98	0.98	0.98	0.84	0.84	0.84	0.79	0.79	0.79	0.87	0.87	0.87
Adj. Flow (vph)	23	12	8	48	19	98	15	1096	109	234	807	45
RTOR Reduction (vph)	0	7	0	0	85	0	0	6	0	0	2	0
Lane Group Flow (vph)	23	13	0	48	32	0	15	1199	0	234	850	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	10.4	10.4		10.9	10.9		1.6	39.7		16.4	54.5	
Effective Green, g (s)	10.9	10.9		10.9	10.9		1.1	41.2		15.9	56.0	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.01	0.52		0.20	0.70	
Clearance Time (s)	4.5	4.5		4.0	4.0		3.5	5.5		3.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	143	226		169	210		22	1703		315	2328	
v/s Ratio Prot		0.01			0.02		0.01	c0.36		c0.15	0.26	
v/s Ratio Perm	0.02			c0.04								
v/c Ratio	0.16	0.06		0.28	0.15		0.68	0.70		0.74	0.36	
Uniform Delay, d1	30.5	30.1		31.0	30.5		39.3	14.8		30.1	4.8	
Progression Factor	1.00	1.00		0.95	1.01		1.00	1.00		1.10	0.57	
Incremental Delay, d2	0.5	0.1		0.9	0.3		62.1	2.5		8.7	0.4	
Delay (s)	31.0	30.2		30.4	31.1		101.4	17.2		42.0	3.2	
Level of Service	C	C		C	C		F	B		D	A	
Approach Delay (s)		30.6			30.9			18.3			11.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.9%	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												
Ideal Flow (vphpl)	1700	1800	1900	1700	1800	1900	1700	1800	1900	1700	1800	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frt	1.00	0.97		1.00	0.97		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3249		1583	3243		1583	4735		1583	4748	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3249		1583	3243		1583	4735		1583	4748	
Volume (vph)	147	375	98	143	247	70	116	1206	155	106	1131	120
Peak-hour factor, PHF	0.85	0.85	0.85	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84
Adj. Flow (vph)	173	441	115	152	263	74	123	1283	165	126	1346	143
RTOR Reduction (vph)	0	16	0	0	16	0	0	8	0	0	7	0
Lane Group Flow (vph)	173	540	0	152	321	0	123	1440	0	126	1482	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.9	22.8		10.2	17.1		11.2	38.5		13.1	40.4	
Effective Green, g (s)	15.9	22.8		10.2	17.1		11.2	38.5		13.1	40.4	
Actuated g/C Ratio	0.16	0.23		0.10	0.17		0.11	0.38		0.13	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	250	736		161	551		176	1812		206	1907	
v/s Ratio Prot	c0.11	c0.17		c0.10	0.10		c0.08	0.30		0.08	c0.31	
v/s Ratio Perm												
v/c Ratio	0.69	0.73		0.94	0.58		0.70	0.79		0.61	0.78	
Uniform Delay, d1	40.0	36.1		44.9	38.5		43.1	27.5		41.3	26.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.0	3.8		54.1	1.6		11.5	2.5		5.3	2.1	
Delay (s)	48.0	39.9		99.1	40.0		54.5	30.0		46.6	28.2	
Level of Service	D	D		F	D		D	C		D	C	
Approach Delay (s)		41.8			58.4			32.0			29.7	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM Average Control Delay	35.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.2%	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												
Ideal Flow (vphpl)	1700	1800	1700	1700	1800	1900	1700	1800	1900	1700	1800	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3308		1583	3301		1583	3157		1583	3203	
Flt Permitted	0.95	1.00		0.95	1.00		0.35	1.00		0.21	1.00	
Satd. Flow (perm)	1583	3308		1583	3301		580	3157		357	3203	
Volume (vph)	116	1044	103	105	790	91	111	258	165	126	214	91
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	122	1099	108	111	832	96	123	287	183	152	258	110
RTOR Reduction (vph)	0	5	0	0	6	0	0	103	0	0	47	0
Lane Group Flow (vph)	122	1202	0	111	922	0	123	367	0	152	321	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8			4		
Actuated Green, G (s)	12.6	55.3		11.3	54.0		26.2	18.5		26.8	18.8	
Effective Green, g (s)	12.6	56.6		11.3	55.3		25.8	19.1		26.4	19.4	
Actuated g/C Ratio	0.11	0.51		0.10	0.50		0.23	0.17		0.24	0.18	
Clearance Time (s)	4.0	5.3		4.0	5.3		3.0	4.6		3.0	4.6	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	4.0		2.0	2.0	
Lane Grp Cap (vph)	181	1702		163	1660		197	548		164	565	
v/s Ratio Prot	c0.08	c0.36		0.07	0.28		0.04	0.12		c0.06	0.10	
v/s Ratio Perm							0.11			c0.16		
v/c Ratio	0.67	0.71		0.68	0.56		0.62	0.67		0.93	0.57	
Uniform Delay, d1	46.7	20.4		47.6	18.9		35.5	42.5		38.1	41.5	
Progression Factor	1.47	0.40		1.20	0.33		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	0.8		5.9	0.9		4.4	3.4		48.3	0.8	
Delay (s)	71.1	8.9		63.0	7.1		39.9	45.9		86.4	42.3	
Level of Service	E	A		E	A		D	D		F	D	
Approach Delay (s)		14.6			13.0			44.7			55.1	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.7%	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												
Ideal Flow (vphpl)	1900	1800	1900	1900	1800	1900	1900	1900	1900	1900	1800	1900
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		0.95			0.95						0.91	
Frt		0.98			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		3292			3300						4780	
Flt Permitted		1.00			0.67						1.00	
Satd. Flow (perm)		3292			2255						4780	
Volume (vph)	0	426	59	163	346	0	0	0	0	52	1006	40
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	0	484	67	172	364	0	0	0	0	56	1082	43
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	534	0	0	536	0	0	0	0	0	1171	0
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		16.0			16.0						16.0	
Effective Green, g (s)		16.0			16.0						16.0	
Actuated g/C Ratio		0.40			0.40						0.40	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		1317			902						1912	
v/s Ratio Prot		0.16										
v/s Ratio Perm					c0.24						0.24	
v/c Ratio		0.41			0.59						0.61	
Uniform Delay, d1		8.6			9.4						9.5	
Progression Factor		1.00			0.34						1.00	
Incremental Delay, d2		0.9			2.5						1.5	
Delay (s)		9.5			5.7						11.0	
Level of Service		A			A						B	
Approach Delay (s)		9.5			5.7			0.0			11.0	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.1%	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												
Ideal Flow (vphpl)	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		0.95			0.95			0.91				
Frt		1.00			0.97			0.98				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		3338			3237			4718				
Flt Permitted		0.87			1.00			1.00				
Satd. Flow (perm)		2915			3237			4718				
Volume (vph)	43	426	0	0	434	130	70	1407	209	0	0	0
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	48	479	0	0	482	144	74	1497	222	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	46	0	0	0	0
Lane Group Flow (vph)	0	527	0	0	622	0	0	1747	0	0	0	0
Turn Type	Perm						Perm					
Protected Phases		4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)		16.0			16.0			16.0				
Effective Green, g (s)		16.0			16.0			16.0				
Actuated g/C Ratio		0.40			0.40			0.40				
Clearance Time (s)		4.0			4.0			4.0				
Lane Grp Cap (vph)		1166			1295			1887				
v/s Ratio Prot					c0.19							
v/s Ratio Perm		0.18						0.37				
v/c Ratio		0.45			0.48			0.93				
Uniform Delay, d1		8.8			8.9			11.4				
Progression Factor		0.36			1.00			0.40				
Incremental Delay, d2		1.2			1.3			5.5				
Delay (s)		4.4			10.2			10.1				
Level of Service		A			B			B				
Approach Delay (s)		4.4			10.2			10.1			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.9%	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												
Ideal Flow (vphpl)	1900	1800	1900	1900	1800	1900	1900	1900	1900	1900	1800	1900
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		0.95			0.95						0.91	
Frt		0.96			1.00						0.99	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		3231			3304						4753	
Flt Permitted		1.00			0.75						1.00	
Satd. Flow (perm)		3231			2514						4753	
Volume (vph)	0	333	106	90	215	0	0	0	0	52	1250	108
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	370	118	101	242	0	0	0	0	55	1316	114
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	24	0
Lane Group Flow (vph)	0	481	0	0	343	0	0	0	0	0	1461	0
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		16.0			16.0						16.0	
Effective Green, g (s)		16.0			16.0						16.0	
Actuated g/C Ratio		0.40			0.40						0.40	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		1292			1006						1901	
v/s Ratio Prot		c0.15										
v/s Ratio Perm					0.14						0.31	
v/c Ratio		0.37			0.34						0.77	
Uniform Delay, d1		8.5			8.3						10.4	
Progression Factor		1.00			0.47						0.69	
Incremental Delay, d2		0.8			0.8						2.6	
Delay (s)		9.3			4.8						9.8	
Level of Service		A			A						A	
Approach Delay (s)		9.3			4.8			0.0			9.8	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.5%	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												
Ideal Flow (vphpl)	1900	1800	1900	1900	1800	1800	1900	1800	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		0.95			1.00	1.00		0.91				
Frt		1.00			1.00	0.85		0.99				
Flt Protected		0.99			1.00	1.00		1.00				
Satd. Flow (prot)		3311			1765	1500		4779				
Flt Permitted		0.82			1.00	1.00		1.00				
Satd. Flow (perm)		2763			1765	1500		4779				
Volume (vph)	97	288	0	0	241	79	64	1463	64	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	310	0	0	254	83	70	1590	70	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	2	0	11	0	0	0	0
Lane Group Flow (vph)	0	414	0	0	254	81	0	1719	0	0	0	0
Turn Type	Perm					Perm	Perm					
Protected Phases		4			8			2				
Permitted Phases	4					8	2					
Actuated Green, G (s)		16.0			16.0	16.0		16.0				
Effective Green, g (s)		16.0			16.0	16.0		16.0				
Actuated g/C Ratio		0.40			0.40	0.40		0.40				
Clearance Time (s)		4.0			4.0	4.0		4.0				
Lane Grp Cap (vph)		1105			706	600		1912				
v/s Ratio Prot					0.14							
v/s Ratio Perm		c0.15				0.05		0.36				
v/c Ratio		0.37			0.36	0.13		0.90				
Uniform Delay, d1		8.5			8.4	7.6		11.2				
Progression Factor		0.38			1.00	1.00		1.00				
Incremental Delay, d2		0.9			1.4	0.5		7.2				
Delay (s)		4.1			9.8	8.1		18.5				
Level of Service		A			A	A		B				
Approach Delay (s)		4.1			9.4			18.5			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group