

CITY OF MONTCLAIR

CMP MONITORING - YEAR 2011

Prepared For

San Bernardino Associated Governments

June 21, 2011

Prepared By



June 21, 2011

Mr. Steve Smith
Principal Transportation Analyst
San Bernardino Associated Governments
1170 W. Third Street, 2nd Floor
San Bernardino, CA 92410

Re: City of Montclair - 2011 Annual CMP Monitoring

Dear Mr. Smith:

Albert Grover & Associates (AGA) is pleased to present this report, which documents the Level of Service (LOS) analyses conducted in the City of Montclair per the requirements of the San Bernardino County Congestion Management Program (CMP). The analyses were conducted to meet the requirements of CMP monitoring in the City of Montclair for the Year 2011. There are six CMP intersections in the City of Montclair as shown in the attached figure. Based on the CMP guidelines, the intersection of Central Avenue/San Bernardino Street requires analysis for Year 2011. The other five intersections do not require CMP analysis for this year.

For your information we have also included a summary of CMP analyses both for this year as well as the past four years for the CMP intersections (see attached table) in the City of Montclair.

Traffic Volumes

Turning movement counts for the study intersection were conducted by Transportation Studies Inc., during the A.M. (6:30 – 8:30) and P.M. (4:00 – 6:00) peak periods in May 2011, and are provided in Appendix A. The counts include turning movements for passenger cars and trucks. The counts included vehicles turning right on red. Per CMP guidelines, passenger car equivalents (PCE) for trucks were used for trucks with 2 axles, 3 axles and 4+ axles.

CMP Intersection Level of Service (LOS)

For conducting intersection LOS analyses, the peak hourly traffic volumes were divided by the peak hour factor (PHF) for each movement (i.e. eastbound left, eastbound through, eastbound right, etc.). Intersection LOS analysis was calculated using the SANBAG-approved software program WEBSTER, an interactive simulation and analysis computer

TRANSPORTATION CONSULTING ENGINEERS

211 E. Imperial Hwy., Suite 208, Fullerton, CA 92835
(714) 992-2990 FAX (714) 992-2883 E-Mail: aga@albertgrover.com

Mr. Steve Smith
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program developed by AGA that provides for signal timing development, capacity analysis and Level of Service determination for individual intersections according to the methodology of the 2010 update to the Highway Capacity Manual. A brief description of WEBSTER program is provided in Appendix B. In the analyses, a cycle length of 90 seconds was used for Central Avenue/San Bernardino Street. This is the cycle length that is utilized for this intersection in the SANBAG Tier 2 Project.

A saturation flow rate of 1800 vehicles per hour per lane (vphpl) was used for through and exclusive right turn lanes. A saturation flow rate of 1700 vphpl was used for a single left turn lane, and a saturation flow rate of 1600 vphpl was used for dual left turn lanes. The analyzed intersection currently operates at delay LOS "C" during the A.M and P.M. peak hours.

As the level of service for the study intersection is better than the CMP threshold LOS "E", deficiency plans will not be required. The next CMP analysis for this intersection will be required in the Year 2014. WEBSTER level of service analysis worksheets for this intersection are provided in Appendix C.

Please call me at (714) 992-2990 if you have any questions.

Respectfully submitted,

ALBERT GROVER & ASSOCIATES



Sally Nguyen
Assistant Transportation Engineer

CC: Mike Hudson, City of Montclair

Attachments

H:\MONTCLAIR\106-011 CMP Monitoring 2011\Montclair 2011 CMP Report.doc

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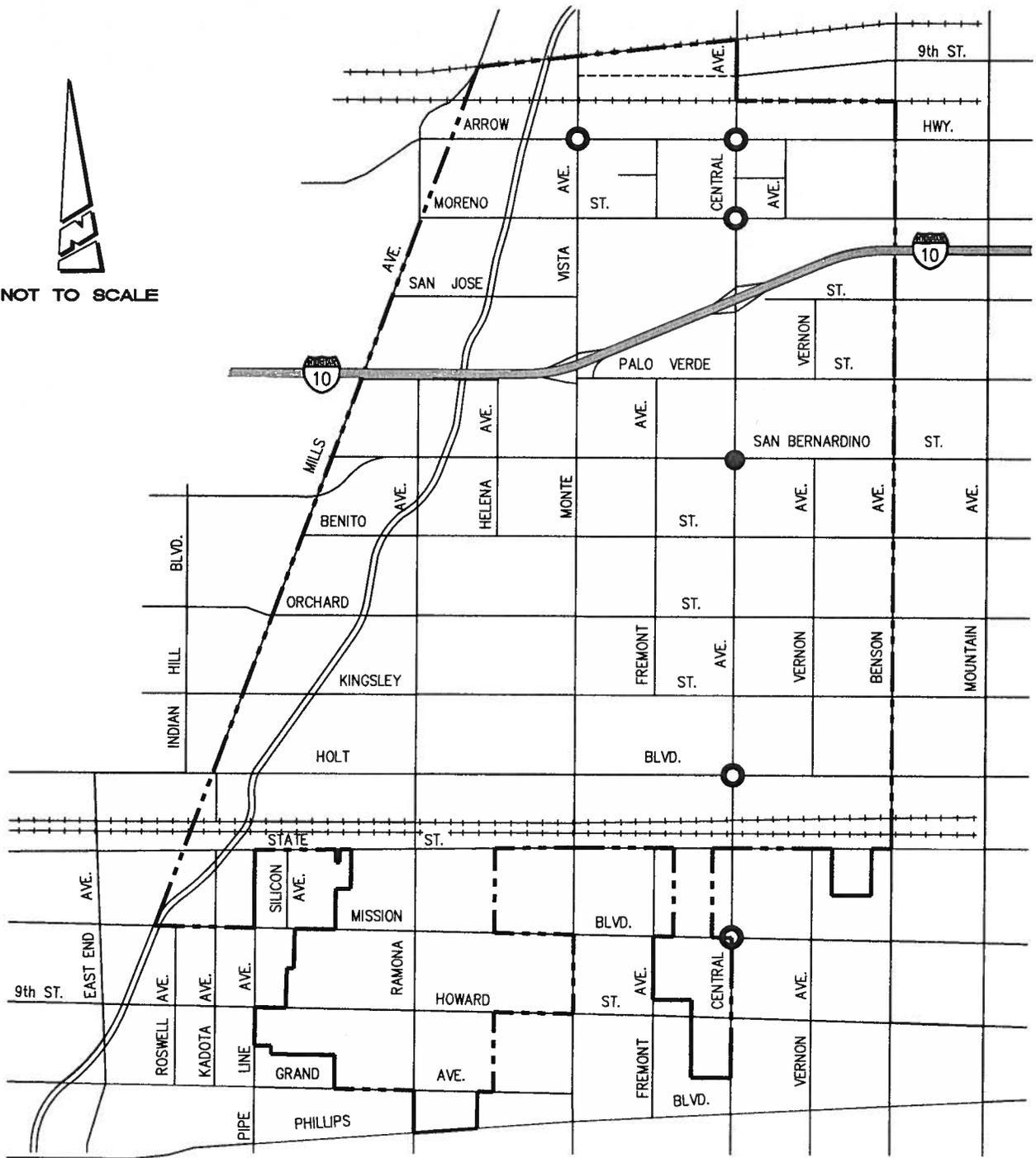
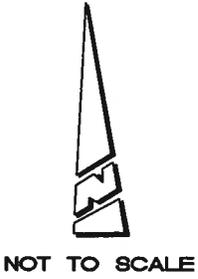
LIST OF EXHIBITS

Figure – Year 2011 CMP Analysis Locations

Table – Year 2011 CMP Intersection Level of Service Summary – City of Montclair

Appendix

- A. Turning Movement Counts (AM & PM) with Truck Classification Counts
 - Central Avenue/San Bernardino Street
- B. WEBSTER Program Overview
- C. Level of Service Analysis using WEBSTER Program (AM & PM)
 - Central Avenue/San Bernardino Street



LEGEND:

- = MONTCLAIR CITY LIMIT
- = CMP INTERSECTION ANALYZED
- = CMP INTERSECTION NOT ANALYZED



**CITY OF MONTCLAIR
2011 CMP ANALYSIS LOCATIONS**

Year 2011 CMP INTERSECTION LEVEL OF SERVICE SUMMARY - CITY OF MONTCLAIR

No.	Intersection		Year 2008						Year 2009						Year 2010						Year 2011						Next CMP Analysis Year	Remarks
	North/South Street	East/West Street	AM			PM			AM			PM			AM			PM			AM			PM				
			Delay (sec)	V/C	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C	LOS											
1	Central Avenue	San Bernardino Street	26	0.60	C	29	0.66	C	--	--	--	--	--	--	--	--	--	--	--	22	0.56	C	26	0.67	C	2014	Year 2011 AM and PM LOS is "C" or better	
2	Central Avenue	Arrow Highway	--	--	--	--	--	--	22	0.34	C	24	0.46	C	--	--	--	--	--	--	--	--	--	--	2012	Year 2009 AM and PM LOS is "C" or better		
3	Central Avenue	Holt Boulevard	--	--	--	--	--	--	--	--	--	--	--	30	0.53	C	31	0.63	C	--	--	--	--	--	2013	Year 2010 AM and PM LOS is "C" or better		
4	Central Avenue	Moreno Street	--	--	--	--	--	--	24	0.38	C	31	0.60	C	--	--	--	--	--	--	--	--	--	--	2012	Year 2009 AM and PM LOS is "C" or better		
5	Central Avenue	Mission Boulevard	--	--	--	--	--	--	30	0.59	C	33	0.62	C	--	--	--	--	--	--	--	--	--	--	2012	Year 2009 AM and PM LOS is "C" or better		
6	Monte Vista Avenue	Arrow Highway	--	--	--	--	--	--	--	--	--	--	--	31	0.56	C	34	0.68	C	--	--	--	--	--	2013	Year 2010 AM and PM LOS is "C" or better		
1	Monte Vista Avenue Grade Crossing (24-hour machine count)														NB - 11,020 veh / SB - 11,611 veh Total - 22,631 veh												2013	

Notes:

1. Delay in seconds; V/C - Volume/Capacity Ratio; LOS - Level of Service;
2. Vehicle delays and LOS calculations are based on the 2000 Highway Capacity Manual. LOS Analysis worksheets for Year 2011 are provided in Appendix C.

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- A. Turning Movement Counts**
- B. WEBSTER Program Overview**
- C. Level of Service Analyses using
WEBSTER Program**

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A*

Turning Movement Counts

Transportation Studies, Inc.
 2640 Walnut Avenue, Suite H
 Tustin, CA. 92780

City: MONTCLAIR
 N-S Direction: CENTRAL AVENUE
 E-W Direction: SAN BERNARDINO STREET

File Name : H1106052
 Site Code : 00005054
 Start Date : 5/31/2011
 Page No : 1

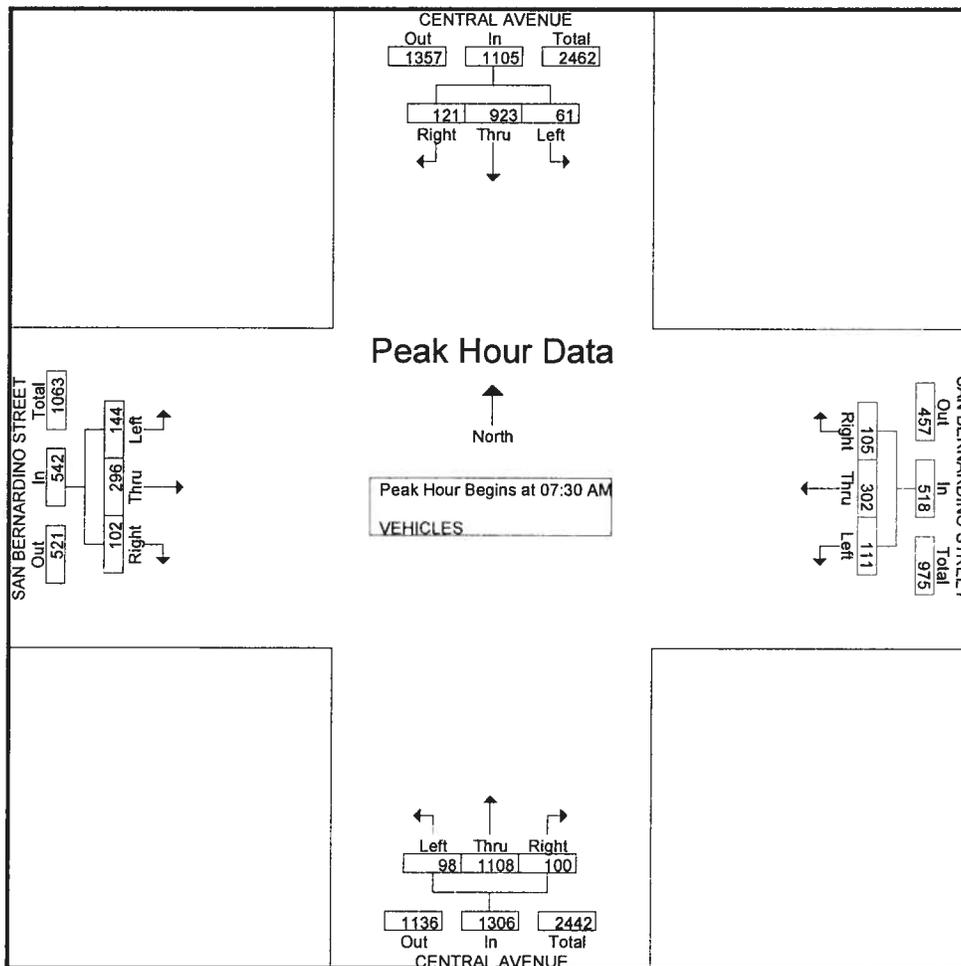
Groups Printed- VEHICLES

Start Time	CENTRAL AVENUE Southbound				SAN BERNARDINO STREET Westbound				CENTRAL AVENUE Northbound				SAN BERNARDINO STREET Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
06:30 AM	21	137	4	0	22	30	13	0	16	214	23	2	13	37	20	0	2	550	552
06:45 AM	22	140	8	2	21	44	17	0	15	223	24	2	18	43	21	0	4	596	600
Total	43	277	12	2	43	74	30	0	31	437	47	4	31	80	41	0	6	1146	1152
07:00 AM	29	168	13	1	23	60	20	1	18	255	27	3	19	61	30	1	6	723	729
07:15 AM	32	191	14	1	23	64	20	1	19	268	29	4	21	70	33	2	8	784	792
07:30 AM	33	221	16	1	27	73	24	1	26	281	28	5	25	77	36	0	7	867	874
07:45 AM	31	233	17	1	25	76	29	3	27	264	23	4	26	79	38	1	9	868	877
Total	125	813	60	4	98	273	93	6	90	1068	107	16	91	287	137	4	30	3242	3272
08:00 AM	29	226	15	0	26	82	27	0	24	271	25	3	27	71	37	1	4	860	864
08:15 AM	28	243	13	0	27	71	31	1	23	292	22	3	24	69	33	1	5	876	881
*** BREAK ***																			
Total	57	469	28	0	53	153	58	1	47	563	47	6	51	140	70	2	9	1736	1745
*** BREAK ***																			
04:00 PM	27	314	39	2	26	37	14	0	16	274	22	2	25	36	49	1	5	879	884
04:15 PM	23	321	31	1	29	33	14	3	17	289	27	2	29	40	51	1	7	904	911
04:30 PM	28	313	39	3	27	43	16	3	18	281	29	1	25	46	43	2	9	908	917
04:45 PM	21	327	42	2	31	39	18	2	16	297	21	4	23	41	44	1	9	920	929
Total	99	1275	151	8	113	152	62	8	67	1141	99	9	102	163	187	5	30	3611	3641
05:00 PM	29	314	46	2	37	41	19	2	18	276	27	1	28	37	45	1	6	917	923
05:15 PM	26	319	41	2	32	37	24	4	19	286	29	2	30	36	49	3	11	928	939
05:30 PM	24	323	39	1	31	33	21	1	22	264	32	2	29	37	41	1	5	896	901
05:45 PM	29	312	37	1	26	40	20	1	21	267	29	1	24	31	34	2	5	870	875
Total	108	1268	163	6	126	151	84	8	80	1093	117	6	111	141	169	7	27	3611	3638
Grand Total	432	4102	414	20	433	803	327	23	315	4302	417	41	386	811	604	18	102	13346	13448
Apprch %	8.7	82.9	8.4		27.7	51.4	20.9		6.3	85.5	8.3		21.4	45	33.5				
Total %	3.2	30.7	3.1		3.2	6	2.5		2.4	32.2	3.1		2.9	6.1	4.5		0.8	99.2	

City: MONTCLAIR
 N-S Direction: CENTRAL AVENUE
 E-W Direction: SAN BERNARDINO STREET

File Name : H1106052
 Site Code : 00005054
 Start Date : 5/31/2011
 Page No : 2

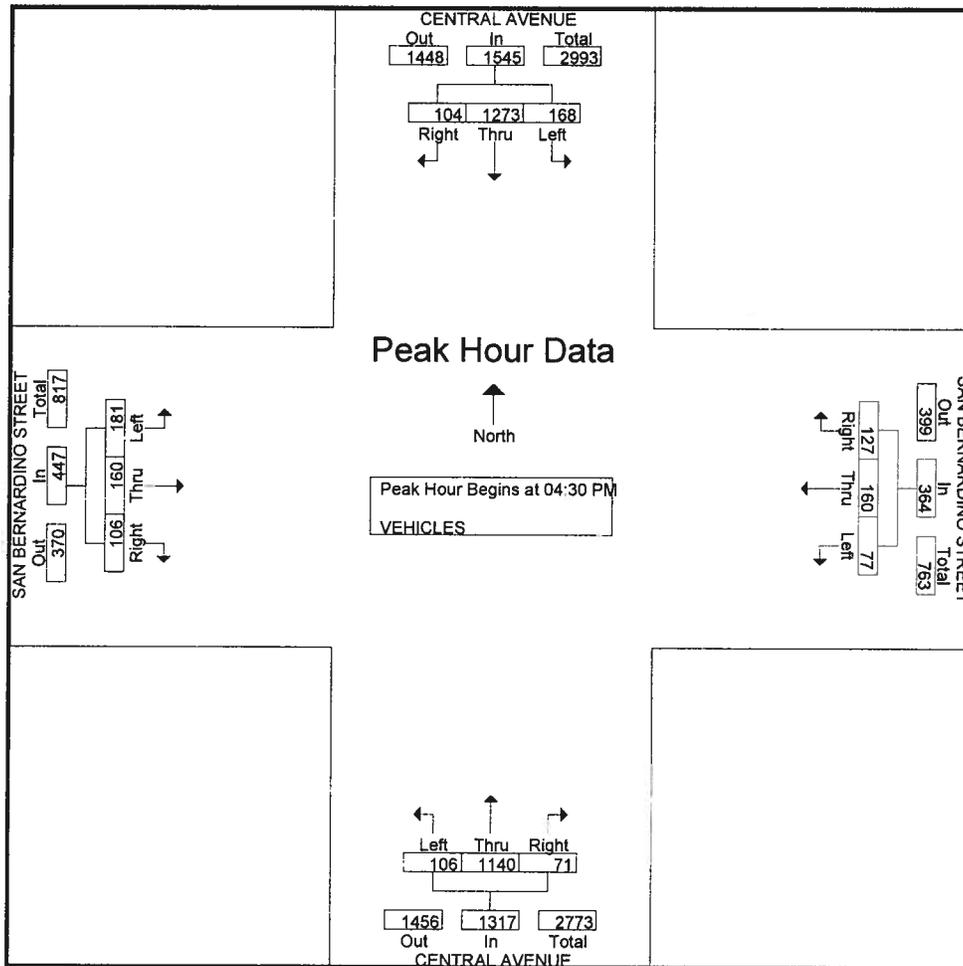
Start Time	CENTRAL AVENUE Southbound				SAN BERNARDINO STREET Westbound				CENTRAL AVENUE Northbound				SAN BERNARDINO STREET Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	33	221	16	270	27	73	24	124	26	281	28	335	25	77	36	138	867
07:45 AM	31	233	17	281	25	76	29	130	27	264	23	314	26	79	38	143	868
08:00 AM	29	226	15	270	26	82	27	135	24	271	25	320	27	71	37	135	860
08:15 AM	28	243	13	284	27	71	31	129	23	292	22	337	24	69	33	126	876
Total Volume	121	923	61	1105	105	302	111	518	100	1108	98	1306	102	296	144	542	3471
% App. Total	11	83.5	5.5		20.3	58.3	21.4		7.7	84.8	7.5		18.8	54.6	26.6		
PHF	.917	.950	.897	.973	.972	.921	.895	.959	.926	.949	.875	.969	.944	.937	.947	.948	.991



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 Page No : 3

Start Time	CENTRAL AVENUE Southbound				SAN BERNARDINO STREET Westbound				CENTRAL AVENUE Northbound				SAN BERNARDINO STREET Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	28	313	39	380	27	43	16	86	18	281	29	328	25	46	43	114	908
04:45 PM	21	327	42	390	31	39	18	88	16	297	21	334	23	41	44	108	920
05:00 PM	29	314	46	389	37	41	19	97	18	276	27	321	28	37	45	110	917
05:15 PM	26	319	41	386	32	37	24	93	19	286	29	334	30	36	49	115	928
Total Volume	104	1273	168	1545	127	160	77	364	71	1140	106	1317	106	160	181	447	3673
% App. Total	6.7	82.4	10.9		34.9	44	21.2		5.4	86.6	8		23.7	35.8	40.5		
PHF	.897	.973	.913	.990	.858	.930	.802	.938	.934	.960	.914	.986	.883	.870	.923	.972	.989



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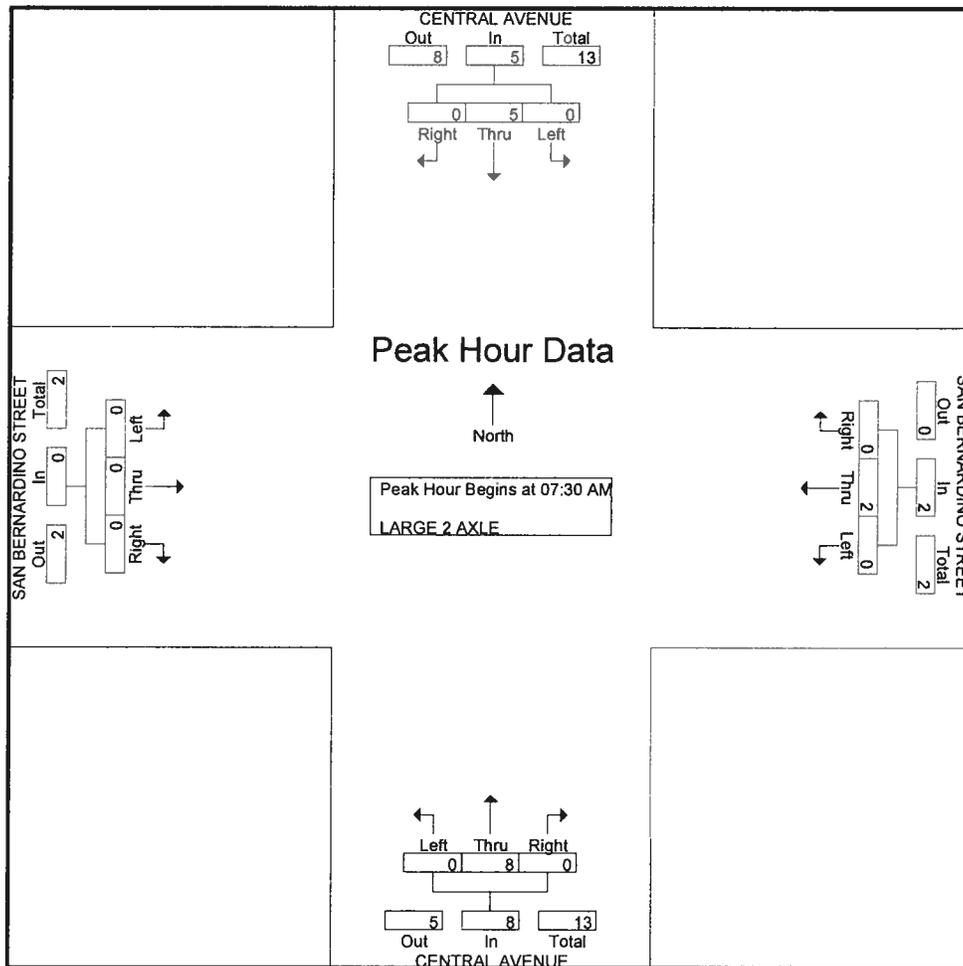
Groups Printed- LARGE 2 AXLE

Start Time	CENTRAL AVENUE Southbound				SAN BERNARDINO STREET Westbound				CENTRAL AVENUE Northbound				SAN BERNARDINO STREET Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
06:30 AM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	2
06:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Total	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4	4
07:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
07:15 AM	0	2	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	5	5
07:30 AM	0	2	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	5	5
07:45 AM	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	3
Total	0	6	0	0	0	1	0	0	0	7	0	0	0	0	0	0	0	14	14
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
08:15 AM	0	2	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	6	6
*** BREAK ***																			
Total	0	2	0	0	0	1	0	0	0	4	0	0	0	0	0	0	0	7	7
*** BREAK ***																			
04:00 PM	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	5	5
04:15 PM	0	2	0	0	1	0	0	0	0	4	0	0	0	0	0	0	0	7	7
04:30 PM	0	3	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	7	7
04:45 PM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	4	4
Total	0	10	0	0	1	1	0	0	0	10	0	0	0	0	1	0	0	23	23
05:00 PM	0	2	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	5	5
05:15 PM	0	2	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	5	5
05:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	2
05:45 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	2
Total	0	5	0	0	0	1	0	0	0	8	0	0	0	0	0	0	0	14	14
Grand Total	0	26	0	0	1	4	0	0	0	30	0	0	0	0	1	0	0	62	62
Apprch %	0	100	0		20	80	0		0	100	0		0	0	100		0		
Total %	0	41.9	0		1.6	6.5	0		0	48.4	0		0	0	1.6		0	100	

City: MONTCLAIR
 N-S Direction: CENTRAL AVENUE
 E-W Direction: SAN BERNARDINO STREET

File Name : H1106052
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 Start Date : 5/31/2011
 Page No : 2

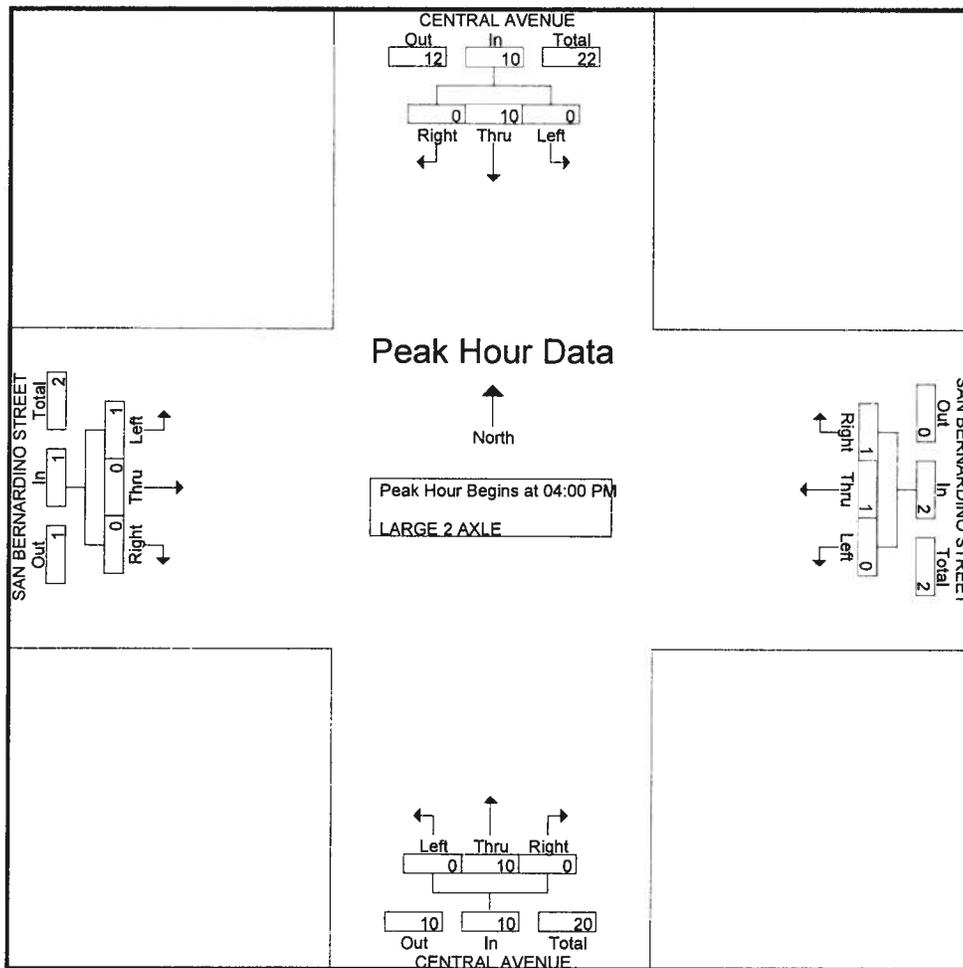
Start Time	CENTRAL AVENUE Southbound				SAN BERNARDINO STREET Westbound				CENTRAL AVENUE Northbound				SAN BERNARDINO STREET Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	2	0	2	0	1	0	1	0	2	0	2	0	0	0	0	5
07:45 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
08:15 AM	0	2	0	2	0	1	0	1	0	3	0	3	0	0	0	0	6
Total Volume	0	5	0	5	0	2	0	2	0	8	0	8	0	0	0	0	15
% App. Total	0	100	0		0	100	0		0	100	0		0	0	0		
PHF	.000	.625	.000	.625	.000	.500	.000	.500	.000	.667	.000	.667	.000	.000	.000	.000	.625



City: MONTCLAIR
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 Page No : 3

Start Time	CENTRAL AVENUE Southbound				SAN BERNARDINO STREET Westbound				CENTRAL AVENUE Northbound				SAN BERNARDINO STREET Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	3	0	3	0	0	0	0	0	2	0	2	0	0	0	0	5
04:15 PM	0	2	0	2	1	0	0	1	0	4	0	4	0	0	0	0	7
04:30 PM	0	3	0	3	0	1	0	1	0	3	0	3	0	0	0	0	7
04:45 PM	0	2	0	2	0	0	0	0	0	1	0	1	0	0	1	1	4
Total Volume	0	10	0	10	1	1	0	2	0	10	0	10	0	0	1	1	23
% App. Total	0	100	0		50	50	0		0	100	0		0	0	100		
PHF	.000	.833	.000	.833	.250	.250	.000	.500	.000	.625	.000	.625	.000	.000	.250	.250	.821



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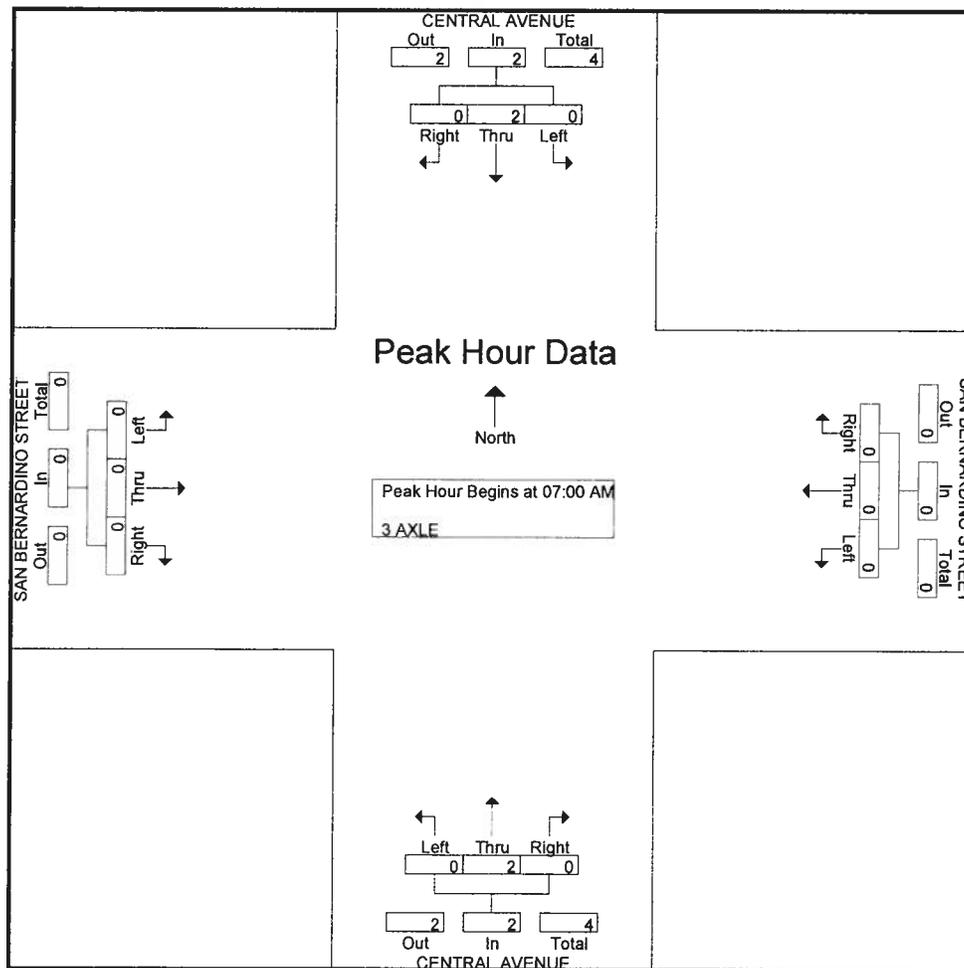
Groups Printed- 3 AXLE

Start Time	CENTRAL AVENUE Southbound				SAN BERNARDINO STREET Westbound				CENTRAL AVENUE Northbound				SAN BERNARDINO STREET Eastbound				Exclu. Total	Inclu. Total	Int. Total	
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds				
06:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
*** BREAK ***																				
Total	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
*** BREAK ***																				
07:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	2
07:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
07:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	4	4
*** BREAK ***																				
08:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
*** BREAK ***																				
Total	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
*** BREAK ***																				
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
*** BREAK ***																				
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	3
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	2
05:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
*** BREAK ***																				
Total	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	4
Grand Total	0	3	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	13	13
Approch %	0	100	0		0	0	0		0	100	0		0	0	0		0			
Total %	0	23.1	0		0	0	0		0	76.9	0		0	0	0		0		100	

City: MONTCLAIR
 N-S Direction: CENTRAL AVENUE
 E-W Direction: SAN BERNARDINO STREET

File Name : H1106052
 Site Code : 00005054
 Start Date : 5/31/2011
 Page No : 2

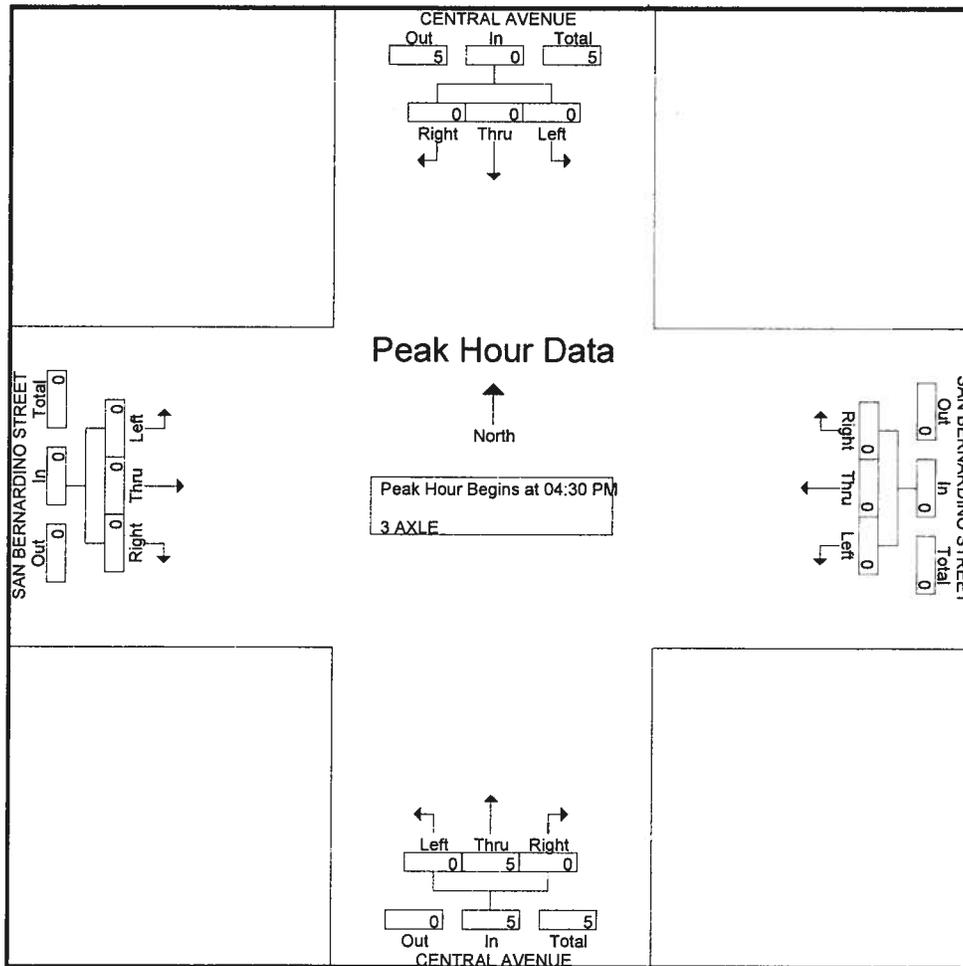
Start Time	CENTRAL AVENUE Southbound				SAN BERNARDINO STREET Westbound				CENTRAL AVENUE Northbound				SAN BERNARDINO STREET Eastbound				Int. Total	
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total		
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:00 AM																		
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0
07:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		0	0
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500



City: MONTCLAIR
 N-S Direction: CENTRAL AVENUE
 E-W Direction: SAN BERNARDINO STREET

File Name : H1106052
 Site Code : 00005054
 Start Date : 5/31/2011
 Page No : 3

Start Time	CENTRAL AVENUE Southbound				SAN BERNARDINO STREET Westbound				CENTRAL AVENUE Northbound				SAN BERNARDINO STREET Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
Total Volume	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	5
% App. Total	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.625	.000	.625	.000	.000	.000	.000	.625



Transportation Studies, Inc.
 2640 Walnut Avenue, Suite H
 Tustin, CA. 92780

City: MONTCLAIR
 N-S Direction: CENTRAL AVENUE
 E-W Direction: SAN BERNARDINO STREET

File Name : H1106052
 Site Code : 00005054
 Start Date : 5/31/2011
 Page No : 1

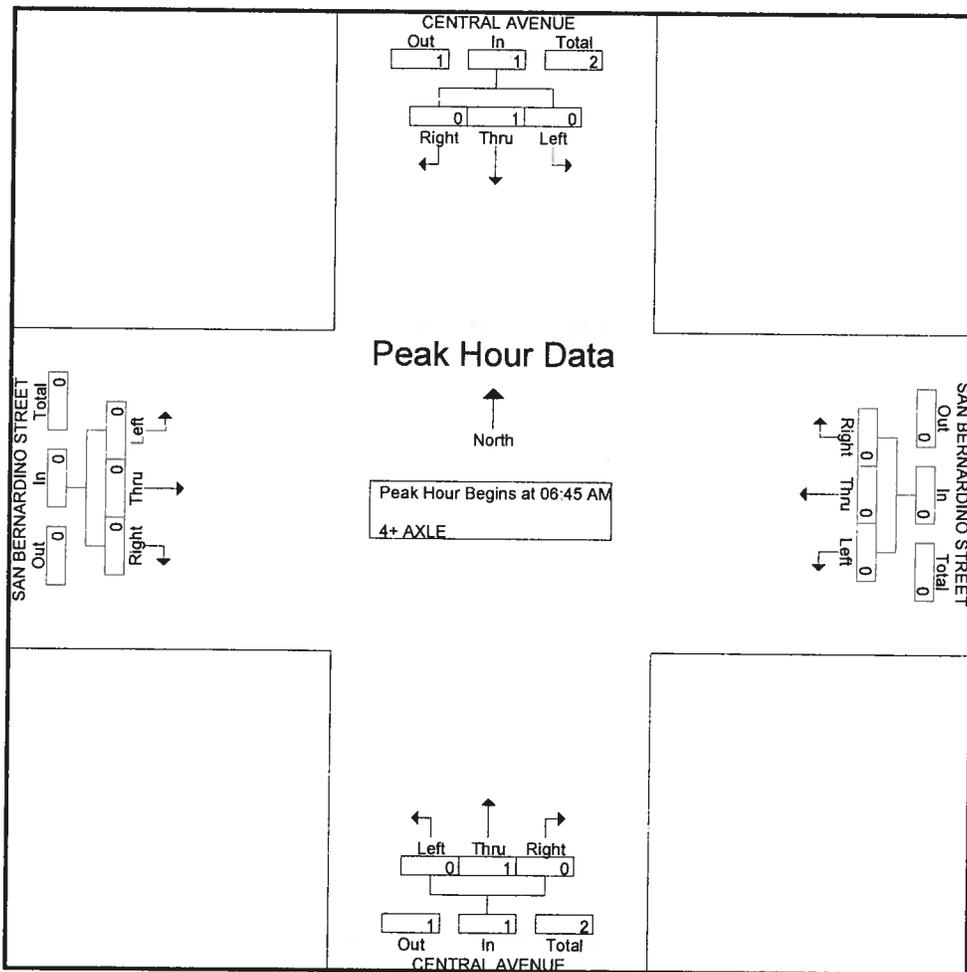
Groups Printed- 4+ AXLE

Start Time	CENTRAL AVENUE Southbound				SAN BERNARDINO STREET Westbound				CENTRAL AVENUE Northbound				SAN BERNARDINO STREET Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
*** BREAK ***																			
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
07:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
*** BREAK ***																			
Total	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	2
*** BREAK ***																			
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
04:15 PM	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	3
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
*** BREAK ***																			
Total	0	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	5	5
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
*** BREAK ***																			
Total	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	2
Grand Total	0	2	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	9	9
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0		0		
Total %	0	22.2	0		0	0	0		0	77.8	0		0	0	0		0	100	

City: MONTCLAIR
 N-S Direction: CENTRAL AVENUE
 E-W Direction: SAN BERNARDINO STREET

File Name : H1106052
 Site Code : 00005054
 Start Date : 5/31/2011
 Page No : 2

Start Time	CENTRAL AVENUE Southbound				SAN BERNARDINO STREET Westbound				CENTRAL AVENUE Northbound				SAN BERNARDINO STREET Eastbound				Int. Total	
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total		
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 06:45 AM																		
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
07:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		0	0
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500



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WEBSTER Program Overview

CAPACITY, LEVEL OF SERVICE AND SIGNAL TIMING ANALYSIS

WEBSTER Overview

WEBSTER is an interactive simulation and analysis program that provides for signal timing development, capacity analysis, queuing analysis, Level of Service (LOS) determination and numerous “What If” scenarios for individual intersections. WEBSTER is an acronym for **WE**bster **B**ased **S**ignal **T**iming **E**valuation **R**outine. The program is a valuable tool for both short and long term planning purposes, for signal design determinations, and for operational evaluations.

The WEBSTER program determines the Level of Service based on the Year 2000 Highway Capacity Manual (HCM) methodology as follows:

Level of Service	<u>Veh. Delay (seconds)</u>
A (minimal delay)	0 to 10
B (short delay)	10.1 to 20
C (average delay)	20.1 to 35
D (long delay)	35.1 to 55
E (very long delay)	55.1 to 80
F (extreme delay or jammed)	Over 80 or $V/C \geq 1.00$

The WEBSTER program can be used to obtain three different solutions: minimum delay cycle time, pre-determined cycle time and required optimum cycle time.

The main input data for WEBSTER are:

- Peak Hour Turning Movement Counts
- Phasing Sequence
- Saturation Flow Rates and Number of Lanes
- Minimum Split Times (defaults provided)
- Progression Factors (defaults provided)

Using WEBSTER, it is possible to test various scenarios at the study intersection. That is, WEBSTER can be run several times at the study intersection to test the impact of various conditions. This is useful for traffic impact analysis and Environmental Impact Reports (EIR) for both “before” and “after” conditions. Additionally, WEBSTER is a useful tool in street/intersection improvement evaluations. The program can be used to evaluate the existing signal timing at a particular intersection or to identify the optimum cycle length when developing new coordination timing, as well as to develop the splits at an intersection. WEBSTER is most useful for personnel familiar with signal operations

who can start using the program immediately. WEBSTER is only intended to serve as a tool for an intelligent analyzer; it would be improper for an uninformed user to merely input raw data and generate output, without engineering evaluation.

The output features of WEBSTER include the following:

- Provides the capability to optimize the green splits at the intersection using the HCM 2000 control delay equation.
- Identifies the optimum (i.e., minimum delay) cycle length for either vehicles only or considering both vehicles and pedestrian clearance times.
- Calculates delay for each lane group and determines the intersection LOS per HCM 2000.
- Provides the average queue (in vehicles) and the design queue length or required storage length (in feet) at the study intersection, based on certain input data and on a per lane basis.
- Allows the user to optimize splits while satisfying all minimum split times, including pedestrian crossing times.
- Optimizes traffic signal settings and/or measures project traffic impacts at a single signalized intersection.
- Evaluates protected/permmissive left-turn phasing and considers signal coordination benefits in the analysis.

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**Level of Service Analyses
using
WEBSTER Program**

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JUN 22 2011

SAN FRANCISCO
ASSOCIATED GOVTS