


































**Appendix A**  
**Existing Synchro Output**

**A.M. Peak Hour**

























1: Warm Spring & Mission Blvd  
Existing AM

6/18/2008

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	 	 		 	 		 	  		 	 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.91	0.91	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3390	1441	3433	5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3390	1441	3433	5085	1583	3433	5085	1583
Volume (vph)	713	565	123	125	603	45	286	1002	272	97	2192	72
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	775	614	134	136	655	49	311	1089	296	105	2383	78
RTOR Reduction (vph)	0	0	77	0	0	33	0	0	125	0	0	22
Lane Group Flow (vph)	775	614	57	136	655	16	311	1089	171	105	2383	56
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8			6			2
Actuated Green, G (s)	30.0	47.8	47.8	10.2	28.0	28.0	12.5	65.5	65.5	10.0	63.0	63.0
Effective Green, g (s)	30.0	47.8	47.8	10.2	28.0	28.0	12.0	66.5	66.5	9.5	64.0	64.0
Actuated g/C Ratio	0.20	0.32	0.32	0.07	0.19	0.19	0.08	0.44	0.44	0.06	0.43	0.43
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	687	1128	504	233	633	269	275	2254	702	217	2170	675
v/s Ratio Prot	c0.23	0.17		0.04	c0.19		c0.09	0.21		0.03	c0.47	
v/s Ratio Perm			0.04			0.01			0.11			0.04
v/c Ratio	1.13	0.54	0.11	0.58	1.03	0.06	1.13	0.48	0.24	0.48	1.10	0.08
Uniform Delay, d1	60.0	42.1	36.1	67.8	61.0	50.2	69.0	29.6	26.1	67.9	43.0	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	75.3	0.5	0.1	3.7	45.0	0.1	94.3	0.2	0.2	1.7	52.0	0.2
Delay (s)	135.3	42.7	36.2	71.5	106.0	50.3	163.3	29.7	26.2	69.6	95.0	25.8
Level of Service	F	D	D	E	F	D	F	C	C	E	F	C
Approach Delay (s)		89.2			97.2			53.6			91.9	
Approach LOS		F			F			D			F	
<b>Intersection Summary</b>												
HCM Average Control Delay			82.2			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.09									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			101.3%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

2: Mohave Drive & Mission Blvd  
Existing AM

6/18/2008

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1745	1583	1770	1863	1583	1770	5085	1583	1770	5075	
Flt Permitted	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1745	1583	1770	1863	1583	1770	5085	1583	1770	5075	
Volume (vph)	56	33	42	115	36	186	22	1151	77	83	2204	29
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	36	46	125	39	202	24	1251	84	90	2396	32
RTOR Reduction (vph)	0	0	43	0	0	184	0	0	38	0	1	0
Lane Group Flow (vph)	47	50	3	125	39	18	24	1251	46	90	2427	0
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3			2			
Actuated Green, G (s)	6.4	6.4	6.4	8.1	8.1	8.1	1.8	42.9	42.9	7.8	48.9	
Effective Green, g (s)	5.4	5.4	5.4	7.1	7.1	7.1	0.8	43.2	43.2	6.8	49.2	
Actuated g/C Ratio	0.07	0.07	0.07	0.09	0.09	0.09	0.01	0.55	0.55	0.09	0.63	
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.3	3.0	4.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	116	120	109	160	169	143	18	2798	871	153	3181	
v/s Ratio Prot	0.03	c0.03		c0.07	0.02		0.01	0.25		c0.05	c0.48	
v/s Ratio Perm			0.00			0.01			0.03			
v/c Ratio	0.41	0.42	0.03	0.78	0.23	0.13	1.33	0.45	0.05	0.59	0.76	
Uniform Delay, d1	35.0	35.0	34.1	34.9	33.2	32.9	38.8	10.5	8.2	34.5	10.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.3	2.3	0.1	21.5	0.7	0.4	331.2	0.5	0.1	5.7	1.1	
Delay (s)	37.3	37.4	34.2	56.4	33.9	33.3	370.0	11.0	8.3	40.2	11.6	
Level of Service	D	D	C	E	C	C	F	B	A	D	B	
Approach Delay (s)		36.3			41.2			17.2			12.6	
Approach LOS		D			D			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			17.2				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			78.5				Sum of lost time (s)		16.0			
Intersection Capacity Utilization			69.6%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

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Summary of All Intervals

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Start Time	6:00
End Time	8:00
Total Time (min)	120
Time Recorded (min)	60
# of Intervals	2
# of Recorded Intvls	1
Vehs Entered	4481
Vehs Exited	4400
Starting Vehs	522
Ending Vehs	603
Denied Entry Before	1455
Denied Entry After	3452
Travel Distance (mi)	4091
Travel Time (hr)	3064.2
Total Delay (hr)	2950.8
Total Stops	20669
Fuel Used (gal)	2088.8

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Interval #0 Information Seeding

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Start Time	6:00
End Time	7:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

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Interval #1 Information Recording

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Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	
Vehs Entered	4481
Vehs Exited	4400
Starting Vehs	522
Ending Vehs	603
Denied Entry Before	1455
Denied Entry After	3452
Travel Distance (mi)	4091
Travel Time (hr)	3064.2
Total Delay (hr)	2950.8
Total Stops	20669
Fuel Used (gal)	2088.8

1: Warm Spring & Mission Blvd Performance by approach

Approach	NB	SB	NE	SW	All
Total Delay (hr)	1095.6	48.6	28.2	87.8	1260.2
Delay / Veh (s)	6105.6	232.6	83.9	215.6	1113.8
Stop Delay (hr)	1092.6	44.9	26.3	73.3	1237.1
Total Stops	1541	1767	1028	3382	7718
Stop/Veh	2.39	2.35	0.85	2.31	1.89
Travel Dist (mi)	134.7	138.9	66.2	318.8	658.6
Travel Time (hr)	1100.5	53.6	30.2	95.3	1279.6
Avg Speed (mph)	3	3	2	3	3
Vehicles Entered	644	773	1203	1463	4083
Vehicles Exited	647	731	1216	1469	4063
Hourly Exit Rate	647	731	1216	1469	4063
Denied Entry Before	696	0	0	0	696
Denied Entry After	1433	0	0	0	1433

2: Mohave Drive & Mission Blvd Performance by approach

Approach	SE	NW	NE	SW	All
Total Delay (hr)	1.3	12.8	4.5	708.8	727.4
Delay / Veh (s)	34.2	178.3	16.7	1813.5	945.7
Stop Delay (hr)	1.3	12.5	2.1	701.7	717.6
Total Stops	120	369	454	2244	3187
Stop/Veh	0.88	1.43	0.47	1.59	1.15
Travel Dist (mi)	4.7	13.9	223.7	174.6	417.0
Travel Time (hr)	1.6	13.4	10.0	712.8	737.8
Avg Speed (mph)	3	1	22	3	5
Vehicles Entered	137	260	966	1403	2766
Vehicles Exited	137	257	966	1411	2771
Hourly Exit Rate	137	257	966	1411	2771
Denied Entry Before	0	0	0	385	385
Denied Entry After	0	0	0	929	929

15: Brown Road & Mission Blvd Performance by approach

Approach	NE	SW	All
Total Delay (hr)	0.8	10.7	11.5
Delay / Veh (s)	2.7	27.4	16.5
Stop Delay (hr)	0.0	8.2	8.3
Total Stops	0	764	764
Stop/Veh	0.00	0.54	0.30
Travel Dist (mi)	138.1	91.5	229.6
Travel Time (hr)	4.3	14.2	18.5
Avg Speed (mph)	32	6	12
Vehicles Entered	1112	1401	2513
Vehicles Exited	1111	1403	2514
Hourly Exit Rate	1111	1403	2514
Denied Entry Before	0	0	0
Denied Entry After	0	0	0

16: SB 680 Off-Ramp & Mission Blvd Performance by approach

Approach	SB	NE	SW	All
Total Delay (hr)	25.4	0.4	0.1	25.9
Delay / Veh (s)	80.6	1.5	1.1	39.0
Stop Delay (hr)	13.4	0.0	0.1	13.5
Total Stops	1063	35	9	1107
Stop/Veh	0.93	0.03	0.03	0.46
Travel Dist (mi)	234.3	67.4	3.6	305.3
Travel Time (hr)	34.4	2.0	0.2	36.6
Avg Speed (mph)	7	34	15	8
Vehicles Entered	1136	1003	258	2397
Vehicles Exited	1138	1002	258	2398
Hourly Exit Rate	1138	1002	258	2398
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

17: Mission Blvd & Performance by approach

Approach	NE	All
Total Delay (hr)	0.3	0.3
Delay / Veh (s)	1.1	1.1
Stop Delay (hr)	0.0	0.0
Total Stops	18	18
Stop/Veh	0.02	0.02
Travel Dist (mi)	32.8	32.8
Travel Time (hr)	1.0	1.0
Avg Speed (mph)	31	31
Vehicles Entered	1002	1002
Vehicles Exited	1001	1001
Hourly Exit Rate	1001	1001
Denied Entry Before	0	0
Denied Entry After	0	0

Total Network Performance

Total Delay (hr)	2950.8
Delay / Veh (s)	2392.5
Stop Delay (hr)	2859.4
Total Stops	20669
Stop/Veh	4.66
Travel Dist (mi)	4090.6
Travel Time (hr)	3064.2
Avg Speed (mph)	7
Vehicles Entered	4481
Vehicles Exited	4400
Hourly Exit Rate	4400
Denied Entry Before	1455
Denied Entry After	3452



Arterial Level of Service: NE Mission Blvd

Cross Street	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	702.2	743.7	0.5	4
Warm Spring	37.6	42.1	0.1	5
Mohave Drive	17.3	36.5	0.2	22
Brown Road	3.2	13.4	0.1	34
SB 680 Off-Ramp	1.5	7.1	0.1	34
	1.1	3.7	0.0	34
<b>Total</b>	<b>762.9</b>	<b>846.4</b>	<b>1.0</b>	<b>6</b>

Arterial Level of Service: SW Mission Blvd

Cross Street	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
SB 680 Off-Ramp	1.1	3.5	0.0	38
Brown Road	28.0	34.5	0.1	7
Mohave Drive	1807.1	1817.2	0.1	3
Warm Spring	218.9	236.6	0.2	3
	4.3	10.3	0.1	22
<b>Total</b>	<b>2059.4</b>	<b>2102.1</b>	<b>0.5</b>	<b>4</b>

Intersection: 1: Warm Spring & Mission Blvd

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SB	NE	NE	NE
Directions Served	L	L	T	T	R	L	L	T	TR	L	L	T
Maximum Queue (ft)	196	222	1090	1109	186	162	333	960	958	200	210	300
Average Queue (ft)	187	189	1087	401	16	34	100	718	698	186	208	293
95th Queue (ft)	199	273	1095	1110	93	95	285	1073	1046	216	214	298
Link Distance (ft)			1075	1075				945	945			217
Upstream Blk Time (%)			55	2				1	0	0	33	78
Queuing Penalty (veh)			0	0				0	0	0	0	0
Storage Bay Dist (ft)	170	170			170	280	280			200	200	
Storage Blk Time (%)	77	34	1	3	0			67	73	12	76	49
Queuing Penalty (veh)	216	96	10	3	0			83	16	39	255	140

Intersection: 1: Warm Spring & Mission Blvd

Movement	NE	NE	NE	B13	B13	SW	SW	SW	SW	SW	SW
Directions Served	T	T	R	T	T	L	L	T	T	T	R
Maximum Queue (ft)	290	295	176	2680	2662	27	272	1087	1108	1075	51
Average Queue (ft)	187	205	98	2521	2509	8	46	1067	1077	951	12
95th Queue (ft)	297	322	194	3042	3057	25	172	1082	1101	1169	37
Link Distance (ft)	217	217		2646	2646			1050	1050	1050	
Upstream Blk Time (%)	10	11		40	43			54	55	11	
Queuing Penalty (veh)	0	0		0	0			426	432	83	
Storage Bay Dist (ft)			150			238	238				238
Storage Blk Time (%)		16	2					58		7	
Queuing Penalty (veh)		45	5					55		5	

Intersection: 2: Mohave Drive & Mission Blvd

Movement	SE	SE	SE	NW	NW	NW	B5	NE	NE	NE	NE	NE
Directions Served	L	LT	R	L	T	R	T	L	T	T	T	R
Maximum Queue (ft)	71	136	50	204	287	203	144	72	327	351	390	221
Average Queue (ft)	22	56	21	200	283	70	138	20	96	104	107	17
95th Queue (ft)	59	100	48	210	294	162	151	60	227	252	262	84
Link Distance (ft)		178	178		215		129		1050	1050	1050	
Upstream Blk Time (%)				24	83	0	86					
Queuing Penalty (veh)				0	0	0	0					
Storage Bay Dist (ft)	121			178		178		207				207
Storage Blk Time (%)		1		90		1		1			2	0
Queuing Penalty (veh)		0		199		1		0			2	0

Intersection: 2: Mohave Drive & Mission Blvd

Movement	SW	SW	SW	SW
Directions Served	L	T	T	TR
Maximum Queue (ft)	283	675	667	606
Average Queue (ft)	77	662	653	498
95th Queue (ft)	250	678	678	758
Link Distance (ft)		606	606	606
Upstream Blk Time (%)		53	47	0
Queuing Penalty (veh)		322	288	2
Storage Bay Dist (ft)	258			
Storage Blk Time (%)	0	70		
Queuing Penalty (veh)	0	58		

Intersection: 15: Brown Road & Mission Blvd

Movement	SW	SW
Directions Served	T	T
Maximum Queue (ft)	364	375
Average Queue (ft)	298	332
95th Queue (ft)	420	460
Link Distance (ft)	310	310
Upstream Blk Time (%)	12	25
Queuing Penalty (veh)	109	232
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 16: SB 680 Off-Ramp & Mission Blvd

Movement	SB	B18	NE	NE	SW
Directions Served	R	T	T	T	T
Maximum Queue (ft)	1100	1656	77	70	80
Average Queue (ft)	954	1511	9	10	11
95th Queue (ft)	1559	2164	38	46	49
Link Distance (ft)	1025	1640	310	310	
Upstream Blk Time (%)	33	36			
Queuing Penalty (veh)	0	0			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 17: Mission Blvd &

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 3124

Intersection: 1: Warm Spring & Mission Blvd

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NEL	SWT	SBL	NBT	SWL	NET	NBL	SBT
Maximum Green (s)	12.5	63.0	11.0	47.0	10.0	65.5	30.0	28.0
Minimum Green (s)	4.0	15.0	4.0	8.0	10.0	15.0	8.0	4.0
Recall	None	Max	None	None	None	None	None	None
Avg. Green (s)	12.5	63.0	9.7	48.9	16.1	65.5	30.0	28.0
g/C Ratio	0.08	0.42	0.06	0.33	0.11	0.40	0.20	0.19
Cycles Skipped (%)	0	0	4	0	0	8	0	0
Cycles @ Minimum (%)	0	0	0	0	91	0	0	0
Cycles Maxed Out (%)	100	100	42	100	100	92	100	100
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): 150.0  
Number of Complete Cycles : 23

Intersection: 2: Mohave Drive & Mission Blvd

Phase	1	2	3	4	5	6
Movement(s) Served	SWL	NET	NWTL	SETL	NEL	SWT
Maximum Green (s)	17.0	35.7	8.0	26.0	5.0	47.7
Minimum Green (s)	4.0	15.0	4.0	4.0	4.0	10.0
Recall	None	Max	None	None	None	None
Avg. Green (s)	8.6	45.2	8.0	12.6	5.0	48.0
g/C Ratio	0.05	0.57	0.10	0.14	0.02	0.61
Cycles Skipped (%)	57	0	0	9	73	0
Cycles @ Minimum (%)	0	0	0	2	0	0
Cycles Maxed Out (%)	0	100	100	13	27	100
Cycles with Peds (%)	0	0	0	0	0	0



































Controller Summary

Average Cycle Length (s): 79.4  
Number of Complete Cycles : 44

**P.M. Peak Hour**

1: Warm Spring & Mission Blvd  
Existing PM

6/18/2008

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	 	 		 	 		 	  		 	  	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.91	0.91	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3390	1441	3433	5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3390	1441	3433	5085	1583	3433	5085	1583
Volume (vph)	530	601	320	356	468	202	143	1527	213	238	1386	183
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	576	653	348	387	509	220	155	1660	232	259	1507	199
RTOR Reduction (vph)	0	0	111	0	0	112	0	0	93	0	0	126
Lane Group Flow (vph)	576	653	237	387	509	108	155	1660	139	259	1507	73
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8			6			2
Actuated Green, G (s)	16.0	24.0	24.0	13.4	21.4	21.4	6.5	29.6	29.6	10.0	33.1	33.1
Effective Green, g (s)	16.0	24.0	24.0	13.4	21.4	21.4	6.0	30.6	30.6	9.5	34.1	34.1
Actuated g/C Ratio	0.17	0.26	0.26	0.14	0.23	0.23	0.06	0.33	0.33	0.10	0.36	0.36
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	587	908	406	492	776	330	220	1664	518	349	1855	577
v/s Ratio Prot	c0.17	c0.18		0.11	0.15		0.05	c0.33		c0.08	c0.30	
v/s Ratio Perm			0.15			0.08			0.09			0.05
v/c Ratio	0.98	0.72	0.58	0.79	0.66	0.33	0.70	1.00	0.27	0.74	0.81	0.13
Uniform Delay, d1	38.6	31.7	30.4	38.7	32.7	30.1	42.9	31.4	23.2	40.8	26.8	19.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	32.2	2.8	2.1	8.1	2.0	0.6	9.8	21.3	0.3	8.3	4.0	0.4
Delay (s)	70.8	34.4	32.5	46.8	34.7	30.6	52.7	52.7	23.5	49.1	30.8	20.2
Level of Service	E	C	C	D	C	C	D	D	C	D	C	C
Approach Delay (s)		47.3			38.1			49.4			32.2	
Approach LOS		D			D			D			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			42.0				HCM Level of Service				D	
HCM Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			93.5				Sum of lost time (s)		20.0			
Intersection Capacity Utilization			81.4%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

2: Mohave Drive & Mission Blvd  
Existing PM

6/18/2008

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1762	1583	1770	1863	1583	1770	5085	1583	1770	5068	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1762	1583	1770	1863	1583	1770	5085	1583	1770	5068	
Volume (vph)	115	103	47	162	54	249	37	2056	110	221	1598	38
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	112	51	176	59	271	40	2235	120	240	1737	41
RTOR Reduction (vph)	0	0	46	0	0	241	0	0	34	0	2	0
Lane Group Flow (vph)	115	122	5	176	59	30	40	2235	86	240	1776	0
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3			2			
Actuated Green, G (s)	13.3	13.3	13.3	14.0	14.0	14.0	4.7	60.0	60.0	18.0	73.3	
Effective Green, g (s)	12.3	12.3	12.3	13.0	13.0	13.0	3.7	60.3	60.3	17.0	73.6	
Actuated g/C Ratio	0.10	0.10	0.10	0.11	0.11	0.11	0.03	0.51	0.51	0.14	0.62	
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.3	4.3	3.0	4.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	174	183	164	194	204	174	55	2585	805	254	3145	
v/s Ratio Prot	0.07	c0.07		c0.10	0.03		0.02	c0.44		c0.14	0.35	
v/s Ratio Perm			0.00			0.02			0.05			
v/c Ratio	0.66	0.67	0.03	0.91	0.29	0.17	0.73	0.86	0.11	0.94	0.56	
Uniform Delay, d1	51.1	51.2	47.8	52.2	48.6	47.9	56.9	25.6	15.2	50.3	13.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.1	8.8	0.1	39.3	0.8	0.5	37.9	4.2	0.3	41.2	0.2	
Delay (s)	60.2	60.0	47.9	91.5	49.3	48.4	94.8	29.7	15.4	91.6	13.4	
Level of Service	E	E	D	F	D	D	F	C	B	F	B	
Approach Delay (s)		57.9			63.5			30.1			22.7	
Approach LOS		E			E			C			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			32.0				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			118.6				Sum of lost time (s)		16.0			
Intersection Capacity Utilization			77.6%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												



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Summary of All Intervals

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Start Time	4:00
End Time	6:00
Total Time (min)	120
Time Recorded (min)	60
# of Intervals	2
# of Recorded Intvls	1
Vehs Entered	6219
Vehs Exited	6194
Starting Vehs	599
Ending Vehs	624
Denied Entry Before	336
Denied Entry After	1061
Travel Distance (mi)	4250
Travel Time (hr)	1306.8
Total Delay (hr)	1181.4
Total Stops	28563
Fuel Used (gal)	994.5

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Interval #0 Information Seeding

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Start Time	4:00
End Time	5:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

No data recorded this interval.

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Interval #1 Information Recording

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Start Time	5:00
End Time	6:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Vehs Entered	6219
Vehs Exited	6194
Starting Vehs	599
Ending Vehs	624
Denied Entry Before	336
Denied Entry After	1061
Travel Distance (mi)	4250
Travel Time (hr)	1306.8
Total Delay (hr)	1181.4
Total Stops	28563
Fuel Used (gal)	994.5

1: Warm Spring & Mission Blvd Performance by approach

Approach	NB	SB	NE	SW	All
Total Delay (hr)	105.3	14.5	24.2	117.8	261.9
Delay / Veh (s)	268.9	50.8	50.0	297.1	168.0
Stop Delay (hr)	102.0	13.2	21.1	102.8	239.1
Total Stops	1885	976	1611	5568	10040
Stop/Veh	1.34	0.95	0.92	3.90	1.79
Travel Dist (mi)	293.6	190.2	95.7	313.3	892.8
Travel Time (hr)	116.1	21.5	27.2	125.6	290.3
Avg Speed (mph)	8	9	4	3	4
Vehicles Entered	1408	1029	1758	1433	5628
Vehicles Exited	1412	1030	1732	1424	5598
Hourly Exit Rate	1412	1030	1732	1424	5598
Denied Entry Before	49	1	0	1	51
Denied Entry After	83	2	0	1	86

2: Mohave Drive & Mission Blvd Performance by approach

Approach	SE	NW	NE	SW	All
Total Delay (hr)	4.5	13.2	16.8	88.9	123.4
Delay / Veh (s)	60.9	174.8	29.7	216.6	109.6
Stop Delay (hr)	4.4	12.9	10.3	80.3	107.8
Total Stops	232	377	1093	3576	5278
Stop/Veh	0.88	1.39	0.54	2.42	1.30
Travel Dist (mi)	9.2	14.5	470.6	181.8	676.0
Travel Time (hr)	5.0	13.9	28.8	93.3	140.9
Avg Speed (mph)	2	1	16	3	6
Vehicles Entered	268	272	2025	1476	4041
Vehicles Exited	262	272	2056	1479	4069
Hourly Exit Rate	262	272	2056	1479	4069
Denied Entry Before	0	0	0	12	12
Denied Entry After	0	0	0	30	30

9: Mission Blvd & Performance by approach

Approach	NB	SB	All
Total Delay (hr)	148.9	0.1	148.9
Delay / Veh (s)	303.8	0.1	149.9
Stop Delay (hr)	111.1	0.0	111.1
Total Stops	8190	0	8190
Stop/Veh	4.64	0.00	2.29
Travel Dist (mi)	818.6	44.5	863.0
Travel Time (hr)	168.0	1.5	169.5
Avg Speed (mph)	5	29	6
Vehicles Entered	1767	1812	3579
Vehicles Exited	1761	1813	3574
Hourly Exit Rate	1761	1813	3574
Denied Entry Before	0	0	0
Denied Entry After	69	0	69

15: Brown Road & Mission Blvd Performance by approach

Approach	NE	SW	All
Total Delay (hr)	1.8	10.2	12.0
Delay / Veh (s)	3.0	25.1	11.9
Stop Delay (hr)	0.0	7.4	7.5
Total Stops	0	990	990
Stop/Veh	0.00	0.68	0.27
Travel Dist (mi)	220.6	95.8	316.4
Travel Time (hr)	7.2	13.9	21.0
Avg Speed (mph)	31	7	15
Vehicles Entered	2167	1466	3633
Vehicles Exited	2162	1466	3628
Hourly Exit Rate	2162	1466	3628
Denied Entry Before	0	0	0
Denied Entry After	0	0	0

16: SB 680 Off-Ramp & Mission Blvd Performance by approach

Approach	SB	NE	SW	All
Total Delay (hr)	24.2	0.2	0.1	24.5
Delay / Veh (s)	72.8	0.7	0.8	34.4
Stop Delay (hr)	11.7	0.0	0.0	11.8
Total Stops	1245	1	8	1254
Stop/Veh	1.04	0.00	0.03	0.49
Travel Dist (mi)	245.7	73.6	3.8	323.1
Travel Time (hr)	33.6	1.9	0.2	35.7
Avg Speed (mph)	7	39	17	9
Vehicles Entered	1200	1095	271	2566
Vehicles Exited	1192	1093	271	2556
Hourly Exit Rate	1192	1093	271	2556
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

17: Mission Blvd & Performance by approach

Approach	NE	All
Total Delay (hr)	0.2	0.2
Delay / Veh (s)	0.6	0.6
Stop Delay (hr)	0.0	0.0
Total Stops	4	4
Stop/Veh	0.00	0.00
Travel Dist (mi)	35.9	35.9
Travel Time (hr)	1.0	1.0
Avg Speed (mph)	36	36
Vehicles Entered	1093	1093
Vehicles Exited	1092	1092
Hourly Exit Rate	1092	1092
Denied Entry Before	0	0
Denied Entry After	0	0

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Total Network Performance

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Total Delay (hr)	1181.4
Delay / Veh (s)	685.3
Stop Delay (hr)	1069.3
Total Stops	28563
Stop/Veh	4.60
Travel Dist (mi)	4249.9
Travel Time (hr)	1306.8
Avg Speed (mph)	7
Vehicles Entered	6219
Vehicles Exited	6194
Hourly Exit Rate	6194
Denied Entry Before	336
Denied Entry After	1061

Arterial Level of Service: NE Mission Blvd

Cross Street	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	303.8	342.8	0.5	5
	15.2	19.2	0.0	7
Warm Spring	53.3	58.5	0.1	4
Mohave Drive	30.0	49.0	0.2	17
Brown Road	3.3	11.6	0.1	39
SB 680 Off-Ramp	0.7	6.2	0.1	39
	0.6	3.3	0.0	38
Total	406.9	490.6	1.0	8

Arterial Level of Service: SW Mission Blvd

Cross Street	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
SB 680 Off-Ramp	0.8	3.2	0.0	42
Brown Road	28.3	34.8	0.1	7
Mohave Drive	219.6	229.6	0.1	3
Warm Spring	317.3	335.2	0.2	2
	5.3	11.3	0.1	20
Total	571.3	614.3	0.5	3

Intersection: 1: Warm Spring & Mission Blvd

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB	NE	NE
Directions Served	L	L	T	T	R	L	L	T	TR	R	L	L
Maximum Queue (ft)	211	224	894	740	196	228	240	211	197	134	131	210
Average Queue (ft)	193	205	456	338	94	126	138	107	109	29	26	93
95th Queue (ft)	202	213	835	749	194	222	238	163	166	82	73	221
Link Distance (ft)			1075	1075				945	945			
Upstream Blk Time (%)												0
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	170	170			170	280	280			225	200	200
Storage Blk Time (%)	42	50	1	4	0							0
Queuing Penalty (veh)	126	151	4	12	0							1

Intersection: 1: Warm Spring & Mission Blvd

Movement	NE	NE	NE	NE	B13	B13	SW	SW	SW	SW	SW	SW
Directions Served	T	T	T	R	T	T	L	L	T	T	T	R
Maximum Queue (ft)	294	293	295	195	170	209	100	273	1100	1110	1124	264
Average Queue (ft)	293	271	257	108	150	179	44	213	1070	1079	1078	186
95th Queue (ft)	295	305	313	205	162	229	91	377	1086	1104	1106	354
Link Distance (ft)	217	217	217		129	129			1050	1050	1050	
Upstream Blk Time (%)	58	36	23		49	39			50	46	47	
Queuing Penalty (veh)	363	226	147		461	369			301	274	280	
Storage Bay Dist (ft)				150			238	238				238
Storage Blk Time (%)	59		40	1					69		71	0
Queuing Penalty (veh)	84		85	4					164		130	1

Intersection: 2: Mohave Drive & Mission Blvd

Movement	SE	SE	SE	NW	NW	NW	B5	NE	NE	NE	NE	NE
Directions Served	L	LT	R	L	T	R	T	L	T	T	T	R
Maximum Queue (ft)	147	194	115	204	287	201	151	232	496	493	532	233
Average Queue (ft)	61	114	45	198	280	57	137	43	264	272	290	40
95th Queue (ft)	125	178	85	211	293	157	153	131	468	467	492	131
Link Distance (ft)		178	178		215		129		1050	1050	1050	
Upstream Blk Time (%)		3		33	81	0	85					
Queuing Penalty (veh)		0		0	0	0	0					
Storage Bay Dist (ft)	121			178		178		207				207
Storage Blk Time (%)	3	13		86		2		0	16		16	
Queuing Penalty (veh)	5	7		261		4		0	6		17	

Intersection: 2: Mohave Drive & Mission Blvd

Movement	SW	SW	SW	SW
Directions Served	L	T	T	TR
Maximum Queue (ft)	283	667	667	669
Average Queue (ft)	246	666	631	651
95th Queue (ft)	347	671	678	684
Link Distance (ft)		606	606	606
Upstream Blk Time (%)		57	35	32
Queuing Penalty (veh)		347	216	192
Storage Bay Dist (ft)	258			
Storage Blk Time (%)	0	68		
Queuing Penalty (veh)	0	151		

Intersection: 9: Mission Blvd &

Movement	NB	NB
Directions Served	T	T
Maximum Queue (ft)	2486	2486
Average Queue (ft)	2437	2437
95th Queue (ft)	2617	2616
Link Distance (ft)	2471	2471
Upstream Blk Time (%)	29	31
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		



Intersection: 15: Brown Road & Mission Blvd

Movement	SW	SW
Directions Served	T	T
Maximum Queue (ft)	364	360
Average Queue (ft)	297	345
95th Queue (ft)	395	418
Link Distance (ft)	310	310
Upstream Blk Time (%)	5	21
Queuing Penalty (veh)	47	189
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 16: SB 680 Off-Ramp & Mission Blvd

Movement	SB	B18	SW
Directions Served	R	T	T
Maximum Queue (ft)	1100	1675	60
Average Queue (ft)	979	1574	7
95th Queue (ft)	1450	2086	34
Link Distance (ft)	1025	1640	
Upstream Blk Time (%)	29	32	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: Mission Blvd &

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 4624
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Intersection: 1: Warm Spring & Mission Blvd

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NEL	SWT	SBL	NBT	SWL	NET	NBL	SBT
Maximum Green (s)	6.5	33.0	14.0	30.0	10.0	29.5	16.0	28.0
Minimum Green (s)	4.0	15.0	4.0	8.0	10.0	15.0	8.0	4.0
Recall	None	Max	None	None	None	None	None	None
Avg. Green (s)	6.3	33.4	13.7	29.0	10.0	30.3	16.0	26.8
g/C Ratio	0.06	0.34	0.14	0.29	0.10	0.31	0.16	0.27
Cycles Skipped (%)	3	0	0	0	6	0	0	0
Cycles @ Minimum (%)	0	0	0	0	94	0	0	0
Cycles Maxed Out (%)	78	100	95	83	94	100	100	81
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): 98.7

Number of Complete Cycles : 35

Intersection: 2: Mohave Drive & Mission Blvd

Phase	1	2	3	4	5	6
Movement(s) Served	SWL	NET	NWTL	SETL	NEL	SWT
Maximum Green (s)	18.0	58.7	14.0	26.0	8.0	68.7
Minimum Green (s)	4.0	15.0	4.0	4.0	4.0	10.0
Recall	None	Max	None	None	None	None
Avg. Green (s)	16.1	59.9	14.0	21.0	7.0	72.1
g/C Ratio	0.13	0.48	0.11	0.17	0.04	0.58
Cycles Skipped (%)	0	0	0	0	29	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	55	100	100	45	36	100
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): 124.1

Number of Complete Cycles : 28

**Appendix B**  
**Existing HCS Output**

**I-680**

**A.M. Peak Hour**

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-680 NB off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing AM

Flow Inputs and Adjustments

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Volume, V	1160	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	315	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, vp	1.00	
Flow rate, vp	646	pc/h/ln

Speed Inputs and Adjustments

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Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

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Flow rate, vp	646	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	11.7	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-680 NB off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing AM

Flow Inputs and Adjustments

---

Volume, V	4793	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1302	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, vp	1.00	
Flow rate, vp	1780	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1780	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	68.1	mi/h
Number of lanes, N	3	
Density, D	26.1	pc/mi/ln
Level of service, LOS	D	

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

Phone:  
E-mail:

Fax:

Operational Analysis

Analyst:  
Agency/Co.:  
Date Performed: 5/28/2008  
Analysis Time Period: Existing AM  
Freeway/dir or Travel: NB I-680 CD Road  
Weaving Location:  
Jurisdiction:  
Analysis Year: 2008  
Description: Mission Improvement PSR

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	2	
Weaving segment length, L	380	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.84	
Weaving ratio, R	0.48	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	274	0	746	682	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	74	0	203	185	v
Trucks and buses	5	5	5	5	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.976	0.976	0.976	0.976	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	305	0	831	759	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	3.82	3.44
Weaving and non-weaving speeds, Si	24.34	25.12
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.33



Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40  
 Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 24.47 mph  
 Weaving segment density, D 38.73 pc/mi/ln  
 Level of service, LOS E  
 Capacity for base condition, cb pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	1590	2800	a
Average flow rate (pcphpl)	947	2250	b
Volume ratio, VR	0.84	1.00	c
Weaving ratio, R	0.48	N/A	d
Weaving length (ft)	380	2500	e

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

Phone: Fax:  
E-mail:

Merge Analysis

Analyst:  
Agency/Co.:  
Date performed: 5/28/2008  
Analysis time period: Existing AM  
Freeway/dir or travel: On ramp from WB 262 to NB 680  
Junction:  
Jurisdiction:  
Analysis Year: 2008  
Description: SR 262 Improvement PSR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4793	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	998	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1160	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4793	998	1160	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1302	271	315	v
Trucks and buses	5	5	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%

Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.976		0.976		0.976	
Driver population factor, fP	1.00		1.00		1.00	
Flow rate, vp	5340		1112		1292	pcp

Estimation of V12 Merge Areas

$L = 1070.53$  (Equation 25-2 or 25-3)  
 EQ  
 $P = 0.577$  Using Equation 1  
 FM  
 $v_{12} = v_F (P_{FM}) = 3084$  pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v <sub>FO</sub>	6452	7050	No
v <sub>R12</sub>	4196	4600	No

Level of Service Determination (if not F)

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 37.7$  pc/mi  
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	M = 0.580	
Space mean speed in ramp influence area,	S <sub>R</sub> = 51.7	mph
Space mean speed in outer lanes,	S <sub>0</sub> = 58.7	mph
Space mean speed for all vehicles,	S = 53.9	mph

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-680 SB off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing AM

Flow Inputs and Adjustments

---

Volume, V	2656	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	722	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, vp	1.00	
Flow rate, vp	1480	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1480	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	26.9	pc/mi/ln
Level of service, LOS	D	

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

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-680 SB off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing AM

Flow Inputs and Adjustments

---

Volume, V	5546	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1507	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, vp	1.00	
Flow rate, vp	1545	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	65.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1545	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	4	
Density, D	23.8	pc/mi/ln
Level of service, LOS	C	

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

Phone:  
E-mail:

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Operational Analysis

Analyst:  
Agency/Co.:  
Date Performed: 5/28/2008  
Analysis Time Period: Existing AM  
Freeway/dir or Travel: SB I-680 CD Road  
Weaving Location:  
Jurisdiction:  
Analysis Year: 2008  
Description: Mission Improvement PSR

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	2	
Weaving segment length, L	330	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.94	
Weaving ratio, R	0.05	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	33	0	28	526	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	9	0	8	143	v
Trucks and buses	5	5	5	5	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.976	0.976	0.976	0.976	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	36	0	31	586	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	1.72	1.20
Weaving and non-weaving speeds, Si	31.55	35.46
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.23

Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40  
 Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 31.74 mph  
 Weaving segment density, D 10.29 pc/mi/ln  
 Level of service, LOS B  
 Capacity for base condition, cb pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	617	2800	a
Average flow rate (pcphpl)	326	2250	b
Volume ratio, VR	0.94	1.00	c
Weaving ratio, R	0.05	N/A	d
Weaving length (ft)	330	2500	e

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

Phone: Fax:  
 E-mail:

Merge Analysis

Analyst:  
 Agency/Co.:  
 Date performed: 5/28/2008  
 Analysis time period: Existing AM  
 Freeway/dir or travel: On ramp from EB 262 to SB 680  
 Junction:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5546	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	872	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1328	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5546	872	1328	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1507	237	361	v
Trucks and buses	5	5	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%



Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.976		0.976		0.976	
Driver population factor, fP	1.00		1.00		1.00	
Flow rate, vp	6179		972		1480	pcp

Estimation of V12 Merge Areas

L = 0.00 (Equation 25-2 or 25-3)  
EQ  
P = 0.096 Using Equation 4  
FM  
 $v_{12} = v_F (P_{FM}) = 595 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v FO	7151	9400	No
v R12	1567	4600	No

Level of Service Determination (if not F)

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 17.3 \text{ pc/mi}$   
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M = 0.340	
Space mean speed in ramp influence area,	S <sub>R</sub> = 57.2	mph
Space mean speed in outer lanes,	S <sub>0</sub> = 55.5	mph
Space mean speed for all vehicles,	S = 55.9	mph

**P.M. Peak Hour**

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-680 NB off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing PM

Flow Inputs and Adjustments

---

Volume, V	1157	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	314	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, vp	1.00	
Flow rate, vp	641	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	641	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	11.7	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-680 NB off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing PM

Flow Inputs and Adjustments

---

Volume, V 5491 veh/h  
 Peak-hour factor, PHF 0.92  
 Peak 15-min volume, v15 1492 v  
 Trucks and buses 4 %  
 Recreational vehicles 0 %  
 Terrain type: Level  
 Grade 0.00 %  
 Segment length 0.00 mi  
 Trucks and buses PCE, ET 1.5  
 Recreational vehicle PCE, ER 1.2  
 Heavy vehicle adjustment, fHV 0.980  
 Driver population factor, vp 1.00  
 Flow rate, vp 2029 pc/h/ln

Speed Inputs and Adjustments

---

Lane width 12.0 ft  
 Right-shoulder lateral clearance 6.0 ft  
 Interchange density 0.50 interchange/mi  
 Number of lanes, N 3  
 Free-flow speed: Measured  
 FFS or BFFS 65.0 mi/h  
 Lane width adjustment, fLW 0.0 mi/h  
 Lateral clearance adjustment, fLC 0.0 mi/h  
 Interchange density adjustment, fID 0.0 mi/h  
 Number of lanes adjustment, fN 3.0 mi/h  
 Free-flow speed, FFS 65.0 mi/h  
 Urban Freeway

LOS and Performance Measures

---

Flow rate, vp 2029 pc/h/ln  
 Free-flow speed, FFS 65.0 mi/h  
 Average passenger-car speed, S 60.9 mi/h  
 Number of lanes, N 3  
 Density, D 33.3 pc/mi/ln  
 Level of service, LOS D

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

Phone:  
E-mail:

Fax:

Operational Analysis

Analyst:  
Agency/Co.:  
Date Performed: 5/28/2008  
Analysis Time Period: Existing PM  
Freeway/dir or Travel: NB I-680 CD Road  
Weaving Location:  
Jurisdiction:  
Analysis Year: 2008  
Description: Mission Improvement PSR

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	2	
Weaving segment length, L	380	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.75	
Weaving ratio, R	0.47	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	372	0	590	515	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	101	0	160	140	v
Trucks and buses	4	4	4	4	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	0.980	0.980	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	412	0	654	570	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	2.96	2.32
Weaving and non-weaving speeds, Si	26.36	28.54
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.20

Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40  
 Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 26.88 mph  
 Weaving segment density, D 30.43 pc/mi/ln  
 Level of service, LOS D  
 Capacity for base condition, cb pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	1224	2800	a
Average flow rate (pcphpl)	818	2250	b
Volume ratio, VR	0.75	1.00	c
Weaving ratio, R	0.47	N/A	d
Weaving length (ft)	380	2500	e

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

Phone: Fax:  
 E-mail:

Merge Analysis

Analyst:  
 Agency/Co.:  
 Date performed: 5/28/2008  
 Analysis time period: Existing PM  
 Freeway/dir or travel: On ramp from WB 262 to NB 680  
 Junction:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5491	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	902	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1157	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5491	902	1157	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1492	245	314	v
Trucks and buses	4	4	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%

Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.980		0.980		0.980	
Driver population factor, fP	1.00		1.00		1.00	
Flow rate, vp	6088		1000		1283	pcp

Estimation of V12 Merge Areas

$L = 1206.63$  (Equation 25-2 or 25-3)  
 EQ  
 $P = 0.577$  Using Equation 1  
 FM  
 $v_{12} = v_F (P_{FM}) = 3516$  pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{FO}$	7088	7050	Yes
$v_{R12}$	4516	4600	No

Level of Service Determination (if not F)

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 40.2$  pc/mi  
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	$M = 0.678$	
Space mean speed in ramp influence area,	$S_R = 49.4$	mph
Space mean speed in outer lanes,	$S_0 = 56.8$	mph
Space mean speed for all vehicles,	$S = 51.9$	mph



Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-680 SB off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing AM

Flow Inputs and Adjustments

---

Volume, V	2050	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	557	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, vp	1.00	
Flow rate, vp	1136	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1136	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	20.7	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-680 SB off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing AM

Flow Inputs and Adjustments

---

Volume, V	3574	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	971	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, vp	1.00	
Flow rate, vp	991	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	65.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	991	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	4	
Density, D	15.2	pc/mi/ln
Level of service, LOS	B	

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

Phone:  
E-mail:

Fax:

Operational Analysis

Analyst:  
Agency/Co.:  
Date Performed: 5/28/2008  
Analysis Time Period: Existing AM  
Freeway/dir or Travel: SB I-680 CD Road  
Weaving Location:  
Jurisdiction:  
Analysis Year: 2008  
Description: Mission Improvement PSR

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	2	
Weaving segment length, L	330	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.98	
Weaving ratio, R	0.16	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	0	5	36	192	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	0	2	10	52	v
Trucks and buses	4	4	4	4	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	0.980	0.980	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	0	5	39	212	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.72	0.38
Weaving and non-weaving speeds, Si	41.14	47.57
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.12

Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40  
 Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 41.25 mph  
 Weaving segment density, D 3.10 pc/mi/ln  
 Level of service, LOS A  
 Capacity for base condition, cb pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	251	2800	a
Average flow rate (pcphpl)	128	2250	b
Volume ratio, VR	0.98	1.00	c
Weaving ratio, R	0.16	N/A	d
Weaving length (ft)	330	2500	e

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

Phone: Fax:  
 E-mail:

Merge Analysis

Analyst:  
 Agency/Co.:  
 Date performed: 5/28/2008  
 Analysis time period: Existing PM  
 Freeway/dir or travel: On ramp from EB 262 to SB 680  
 Junction:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3574	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	1158	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1025	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3574	1158	1025	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	971	315	279	v
Trucks and buses	4	4	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%

Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.980		0.980		0.980	
Driver population factor, fP	1.00		1.00		1.00	
Flow rate, vp	3962		1284		1136	pcp

Estimation of V12 Merge Areas

L = 0.00 (Equation 25-2 or 25-3)  
EQ  
P = 0.057 Using Equation 4  
FM  
 $v_{12} = v_F (P_{FM}) = 227 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v <sub>FO</sub>	5246	9400	No
v <sub>R12</sub>	1511	4600	No

Level of Service Determination (if not F)

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 16.7 \text{ pc/mi}$   
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M = 0.339	
Space mean speed in ramp influence area,	S <sub>R</sub> = 57.2	mph
Space mean speed in outer lanes,	S <sub>0</sub> = 60.1	mph
Space mean speed for all vehicles,	S = 59.2	mph

**I-880**

**A.M. Peak Hour**



Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-880 NB off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing AM

Flow Inputs and Adjustments

---

Volume, V	2402	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	653	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, vp	1.00	
Flow rate, vp	1338	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1338	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	24.3	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-880 NBseg off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing AM

Flow Inputs and Adjustments

---

Volume, V	3078	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	836	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, vp	1.00	
Flow rate, vp	1143	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	65.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1143	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	17.6	pc/mi/ln
Level of service, LOS	B	

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

Phone:  
E-mail:

Fax:

Operational Analysis

Analyst:  
Agency/Co.:  
Date Performed: 6/17/2008  
Analysis Time Period: AM Peak  
Freeway/dir or Travel: WB262 to Fremont off  
Weaving Location:  
Jurisdiction:  
Analysis Year: 2008  
Description:

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	4	
Weaving segment length, L	2000	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.30	
Weaving ratio, R	0.19	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	2843	86	235	994	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	773	23	64	270	v
Trucks and buses	5	5	5	5	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.976	0.976	0.976	0.976	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	3167	95	261	1107	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.44	0.24
Weaving and non-weaving speeds, Si	53.17	59.19
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.21

Maximum number of lanes, Nw (max) (Exhibit 24-7) 3.50  
 Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 57.27 mph  
 Weaving segment density, D 20.21 pc/mi/ln  
 Level of service, LOS C  
 Capacity for base condition, cb 8770 pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	1368	4000	a
Average flow rate (pcphpl)	1157	2350	b
Volume ratio, VR	0.30	0.80	c
Weaving ratio, R	0.19	N/A	d
Weaving length (ft)	2000	2500	e

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

Phone: Fax:  
 E-mail:

Operational Analysis

Analyst:  
 Agency/Co.:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/dir or Travel: SB I-880  
 Weaving Location: From Fremont Blvd to W. Waren  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing AM

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	4	
Weaving segment length, L	1150	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.08	
Weaving ratio, R	0.18	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	5679	10	93	432	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	1543	3	25	117	v
Trucks and buses	5	5	5	5	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.976	0.976	0.976	0.976	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	6327	11	103	481	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.88	0.40
Weaving and non-weaving speeds, Si	44.21	54.37
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		0.71

Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40  
 Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 53.33 mph  
 Weaving segment density, D 32.45 pc/mi/ln  
 Level of service, LOS D  
 Capacity for base condition, cb 8466 pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	584	2800	a
Average flow rate (pcphpl)	1730	2350	b
Volume ratio, VR	0.08	0.35	c
Weaving ratio, R	0.18	N/A	d
Weaving length (ft)	1150	2500	e

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

Phone:  
E-mail:

Fax:

Diverge Analysis

Analyst:  
Agency/Co.:  
Date performed: 6/16/2008  
Analysis time period:  
Freeway/dir or travel: SB I-880 Diverge to SR 262  
Junction:  
Jurisdiction:  
Analysis Year: 2008  
Description: Existing AM

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	6111	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	336	vph
Length of first accel/decel lane		ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	2759	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2576	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6111	336	2759	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1661	91	750	v
Trucks and buses	5	5	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	%

Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.976		0.976		0.976	
Driver population factor, fP	1.00		1.00		1.00	
Flow rate, vp	6808		374		3074	pcp

Estimation of V12 Diverge Areas

L = 0.00 (Equation 25-8 or 25-9)  
EQ  
P = 0.573 Using Equation 5  
FD  
 $v_{12} = v_R + (v_F - v_R) P = 4058$  pc/h  
FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6808	7050	No
$v_{12}$	4058	4400	No
$v_{FO} = v_F - v_R$	6434	7050	No
$v_R$	374	2000	No

Level of Service Determination (if not F)

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D =$  pc/mi/  
Level of service for ramp-freeway junction areas of influence

Speed Estimation

Intermediate speed variable,	D = 0.462	
Space mean speed in ramp influence area,	S = 54	mph
Space mean speed in outer lanes,	S = 64.5	mph
Space mean speed for all vehicles,	S = 58.1	mph



Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-880 SB on-ramp from 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing AM

Flow Inputs and Adjustments

---

Volume, V	8534	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	2319	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, vp	1.00	
Flow rate, vp	2377	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	65.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	2377	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	4	
Density, D		pc/mi/ln
Level of service, LOS	F	

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

**P.M. Peak Hour**

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-880 NB off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing PM

Flow Inputs and Adjustments

---

Volume, V	2656	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	722	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, vp	1.00	
Flow rate, vp	1472	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1472	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	22.6	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-880 NBseg off-ramp to SR 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing PM

Flow Inputs and Adjustments

---

Volume, V	5153	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1400	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, vp	1.00	
Flow rate, vp	1904	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	65.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1904	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.8	mi/h
Number of lanes, N	3	
Density, D	30.3	pc/mi/ln
Level of service, LOS	D	

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

Phone: Fax:  
 E-mail:

Operational Analysis

Analyst:  
 Agency/Co.:  
 Date Performed: 6/17/2008  
 Analysis Time Period: PM Peak  
 Freeway/dir or Travel: WB262 to Fremont off  
 Weaving Location:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description:

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	4	
Weaving segment length, L	2000	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.25	
Weaving ratio, R	0.46	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	4452	135	701	831	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	1210	37	190	226	v
Trucks and buses	4	4	4	4	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	0.980	0.980	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	4935	149	777	921	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.53	0.29
Weaving and non-weaving speeds, Si	50.88	57.64
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.03

Maximum number of lanes, Nw (max) (Exhibit 24-7) 3.50  
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 55.79 mph  
Weaving segment density, D 30.39 pc/mi/ln  
Level of service, LOS D  
Capacity for base condition, cb 9068 pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	1698	4000	a
Average flow rate (pcphpl)	1695	2350	b
Volume ratio, VR	0.25	0.80	c
Weaving ratio, R	0.46	N/A	d
Weaving length (ft)	2000	2500	e

Notes:

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

Phone: Fax:  
 E-mail:

Operational Analysis

Analyst:  
 Agency/Co.:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/dir or Travel: SB I-880  
 Weaving Location: From Fremont Blvd to W. Waren  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing PM

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	4	
Weaving segment length, L	1150	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.12	
Weaving ratio, R	0.17	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	4724	11	102	515	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	1284	3	28	140	v
Trucks and buses	4	4	4	4	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	0.980	0.980	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	5237	12	113	570	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	0.81	0.36
Weaving and non-weaving speeds, Si	45.41	55.34
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		0.84

Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40  
 Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 53.98 mph  
 Weaving segment density, D 27.47 pc/mi/ln  
 Level of service, LOS C  
 Capacity for base condition, cb 8367 pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	683	2800	a
Average flow rate (pcphpl)	1483	2350	b
Volume ratio, VR	0.12	0.35	c
Weaving ratio, R	0.17	N/A	d
Weaving length (ft)	1150	2500	e

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



Phone:  
E-mail:

Fax:

Diverge Analysis

Analyst:  
Agency/Co.:  
Date performed: 6/16/2008  
Analysis time period:  
Freeway/dir or travel: SB I-880 Diverge to SR 262  
Junction:  
Jurisdiction:  
Analysis Year: 2008  
Description: Existing PM

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5239	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	555	vph
Length of first accel/decel lane		ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1836	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2576	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5239	555	1836	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1424	151	499	v
Trucks and buses	4	4	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	%

Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.980		0.980		0.980	
Driver population factor, fP	1.00		1.00		1.00	
Flow rate, vp	5808		615		2036	pcp

Estimation of V12 Diverge Areas

L = 0.00 (Equation 25-8 or 25-9)  
EQ  
P = 0.587 Using Equation 5  
FD  
 $v_{12} = v_R + (v_F - v_R) P = 3661 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5808	7050	No
$v_{12}$	3661	4400	No
$v_{FO} = v_F - v_R$	5193	7050	No
$v_R$	615	2000	No

Level of Service Determination (if not F)

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D =$  pc/mi/  
Level of service for ramp-freeway junction areas of influence

Speed Estimation

Intermediate speed variable,	D = 0.483	
Space mean speed in ramp influence area,	S = 54	mph
Space mean speed in outer lanes,	S = 66.8	mph
Space mean speed for all vehicles,	S = 58.0	mph

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 6/16/2008  
 Analysis Time Period:  
 Freeway/Direction: I-880 SB on-ramp from 262  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: Existing AM

Flow Inputs and Adjustments

---

Volume, V	6674	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1814	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, vp	1.00	
Flow rate, vp	1850	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	65.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1850	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.4	mi/h
Number of lanes, N	4	
Density, D	29.2	pc/mi/ln
Level of service, LOS	D	

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

**SR 262**

**A.M. Peak Hour**

Phone: Fax:  
 E-mail:

Merge Analysis

Analyst:  
 Agency/Co.:  
 Date performed: 6/17/2008  
 Analysis time period: Existing AM  
 Freeway/dir or travel: SB I-880 off at NB880 off to 262  
 Junction:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1201	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	336	vph
Length of first accel/decel lane		ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1201	336		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	326	91		v
Trucks and buses	5	5		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level	Level	
Grade	%	%		%

Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.976		0.976			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	1338		374			pcp

Estimation of V12 Merge Areas

L = 0.00 (Equation 25-2 or 25-3)  
EQ  
P = 1.000 Using Equation 0  
FM  
 $v_{12} = v_F (P_{FM}) = 1338 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v <sub>FO</sub>	1712	4500	No
v <sub>R12</sub>	1872	4600	No

Level of Service Determination (if not F)

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A =$  pc/mi  
Level of service for ramp-freeway junction areas of influence

Speed Estimation

Intermediate speed variable,	M = 0.311	
Space mean speed in ramp influence area,	S <sub>R</sub> =	mph
Space mean speed in outer lanes,	S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,	S =	mph

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 5/28/2008  
 Analysis Time Period: Existing AM  
 Freeway/Direction: EB 262 at off-ramp to SB 680  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Flow Inputs and Adjustments

---

Volume, V 0 veh/h  
 Peak-hour factor, PHF 1.00  
 Peak 15-min volume, v15 0 v  
 Trucks and buses 0 %  
 Recreational vehicles 0 %  
 Terrain type: Level  
 Grade 0.00 %  
 Segment length 0.00 mi  
 Trucks and buses PCE, ET 1.5  
 Recreational vehicle PCE, ER 1.2  
 Heavy vehicle adjustment, fHV 1.000  
 Driver population factor, vp 1.00  
 Flow rate, vp 0 pc/h/ln

Speed Inputs and Adjustments

---

Lane width 12.0 ft  
 Right-shoulder lateral clearance 6.0 ft  
 Interchange density 0.50 interchange/mi  
 Number of lanes, N 2  
 Free-flow speed: Measured  
 FFS or BFFS 55.0 mi/h  
 Lane width adjustment, fLW 0.0 mi/h  
 Lateral clearance adjustment, fLC 0.0 mi/h  
 Interchange density adjustment, fID 0.0 mi/h  
 Number of lanes adjustment, fN 4.5 mi/h  
 Free-flow speed, FFS 55.0 mi/h  
 Urban Freeway

LOS and Performance Measures

---

Flow rate, vp 0 pc/h/ln  
 Free-flow speed, FFS 55.0 mi/h  
 Average passenger-car speed, S mi/h  
 Number of lanes, N 2  
 Density, D 0.0 pc/mi/ln  
 Level of service, LOS A

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



Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 5/28/2008  
 Analysis Time Period: Existing AM  
 Freeway/Direction: EB 262 at off-ramp to SB 680  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Flow Inputs and Adjustments

---

Volume, V	1080	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	293	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, vp	1.00	
Flow rate, vp	602	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	602	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	10.9	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
 E-mail:

Operational Analysis

Analyst:  
 Agency/Co.:  
 Date Performed: 5/28/2008  
 Analysis Time Period: Existing AM  
 Freeway/dir or Travel: EB 262 at 680  
 Weaving Location: SB 680 off to NB 680 on  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	580	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.64	
Weaving ratio, R	0.04	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	398	0	682	28	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	108	0	185	8	v
Trucks and buses	5	5	5	5	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.976	0.976	0.976	0.976	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	443	0	759	31	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	2.20	0.31
Weaving and non-weaving speeds, Si	29.08	49.44
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.55

Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40  
 Type of operation is Constrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 34.13 mph  
 Weaving segment density, D 12.04 pc/mi/ln  
 Level of service, LOS B  
 Capacity for base condition, cb 3928 pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	790	2800	a
Average flow rate (pcphpl)	411	2250	b
Volume ratio, VR	0.64	0.45	c
Weaving ratio, R	0.04	N/A	d
Weaving length (ft)	580	2500	e

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

Phone: Fax:  
 E-mail:

Merge Analysis

Analyst:  
 Agency/Co.:  
 Date performed: 5/28/2008  
 Analysis time period: Existing AM  
 Freeway/dir or travel: EB 262 at NB 680 off-ramp  
 Junction:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	426	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	140	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	682	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	385	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	426	140	682	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	116	38	185	v
Trucks and buses	5	5	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%

	mi	mi	mi	mi
Length				
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.976	0.976	0.976	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	475	156	760	pcp

Estimation of V12 Merge Areas

$L = 0.00$  (Equation 25-2 or 25-3)  
 $P = 1.000$  Using Equation 0  
 $v_{12} = v_F (P_{FM}) = 475$  pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{FO}$	631	4500	No
$v_{R12}$	631	4600	No

Level of Service Determination (if not F)

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 10.3$  pc/mi  
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M = 0.328$	
Space mean speed in ramp influence area,	$S_R = 50.7$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 50.7$	mph

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 5/28/2008  
 Analysis Time Period: Existing AM  
 Freeway/Direction: Major diverge to NB &SB 880  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Flow Inputs and Adjustments

---

Volume, V	3356	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	912	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, vp	1.00	
Flow rate, vp	1870	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1870	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	54.9	mi/h
Number of lanes, N	2	
Density, D	34.1	pc/mi/ln
Level of service, LOS	D	

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

Phone:  
E-mail:

Fax:

Diverge Analysis

Analyst:  
Agency/Co.:  
Date performed: 5/28/2008  
Analysis time period: Existing AM  
Freeway/dir or travel: WB 262 Diverge to NB 680  
Junction:  
Jurisdiction:  
Analysis Year: 2008  
Description: SR 262 Improvement

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	810	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	42	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	746	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	530	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	810	42	746	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	220	11	203	v
Trucks and buses	5	5	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	

Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.976		0.976		0.976	
Driver population factor, fP	1.00		1.00		1.00	
Flow rate, vp	902		47		831	pcp

Estimation of V12 Diverge Areas

L = 0.00 (Equation 25-8 or 25-9)  
EQ  
P = 1.000 Using Equation 0  
FD  
 $v_{12} = v_R + (v_F - v_R) P = 902 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	902	4500	No
$v_{12}$	902	4400	No
$v_{FO} = v_F - v_R$	855	4500	No
$v_R$	47	2100	No

Level of Service Determination (if not F)

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 12.0 \text{ pc/mi/}$   
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D = 0.367	
Space mean speed in ramp influence area,	S = 50	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 50.2	mph



Phone:  
E-mail:

Fax:

Operational Analysis

Analyst:  
Agency/Co.:  
Date Performed: 5/28/2008  
Analysis Time Period: Existing AM  
Freeway/dir or Travel: WB 262 at 680  
Weaving Location: NB 680 off to SB 680 on  
Jurisdiction:  
Analysis Year: 2008  
Description: SR 262 Improvement PSR

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	550	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.84	
Weaving ratio, R	0.41	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	242	0	526	746	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	66	0	143	203	v
Trucks and buses	5	5	5	5	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.976	0.976	0.976	0.976	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	269	0	586	831	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	4.00	0.76
Weaving and non-weaving speeds, Si	24.00	40.59
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.94

Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40  
 Type of operation is Constrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 25.68 mph  
 Weaving segment density, D 21.89 pc/mi/ln  
 Level of service, LOS C  
 Capacity for base condition, cb 3910 pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	1417	2800	a
Average flow rate (pcphpl)	562	2250	b
Volume ratio, VR	0.84	0.45	c
Weaving ratio, R	0.41	N/A	d
Weaving length (ft)	550	2500	e

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

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 5/28/2008  
 Analysis Time Period: Existing AM  
 Freeway/Direction: WB 262 at SB 680 off-ramp  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Flow Inputs and Adjustments

---

Volume, V	2316	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	579	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, vp	1.00	
Flow rate, vp	1187	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1187	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	21.6	pc/mi/ln
Level of service, LOS	C	

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

**P.M. Peak Hour**

Phone: Fax:  
 E-mail:

Merge Analysis

Analyst:  
 Agency/Co.:  
 Date performed: 6/17/2008  
 Analysis time period: Existing AM  
 Freeway/dir or travel: SB I-880 off at NB880 off to 262  
 Junction:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1328	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	401	vph
Length of first accel/decel lane		ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1328	401		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	361	109		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level	Level	
Grade	%	%		%

Length		mi		mi		mi
Trucks and buses PCE, ET		1.5		1.5		
Recreational vehicle PCE, ER		1.2		1.2		
Heavy vehicle adjustment, fHV		0.980		0.980		
Driver population factor, fP		1.00		1.00		
Flow rate, vp		1472		445		pcp

Estimation of V12 Merge Areas

L = 0.00 (Equation 25-2 or 25-3)  
EQ  
P = 1.000 Using Equation 0  
FM  
 $v_{12} = v_F (P_{FM}) = 1472 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v <sub>FO</sub>	1917	4500	No
v <sub>R12</sub>	2093	4600	No

Level of Service Determination (if not F)

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A =$  pc/mi  
Level of service for ramp-freeway junction areas of influence

Speed Estimation

Intermediate speed variable,	M = 0.318	
Space mean speed in ramp influence area,	S <sub>R</sub> =	mph
Space mean speed in outer lanes,	S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,	S =	mph

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 5/28/2008  
 Analysis Time Period: Existing PM  
 Freeway/Direction: EB 262 at off-ramp to SB 680  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Flow Inputs and Adjustments

---

Volume, V	1932	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	483	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, vp	1.00	
Flow rate, vp	985	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	985	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	17.9	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 5/28/2008  
 Analysis Time Period: Existing AM  
 Freeway/Direction: EB 262 at off-ramp to SB 680  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Flow Inputs and Adjustments

---

Volume, V	1454	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	395	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, vp	1.00	
Flow rate, vp	806	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	806	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	14.7	pc/mi/ln
Level of service, LOS	B	

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



Phone:  
E-mail:

Fax:

Operational Analysis

Analyst:  
Agency/Co.:  
Date Performed: 5/28/2008  
Analysis Time Period: Existing PM  
Freeway/dir or Travel: EB 262 at 680  
Weaving Location: SB 680 off to NB 680 on  
Jurisdiction:  
Analysis Year: 2008  
Description: SR 262 Improvement PSR

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	580	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.67	
Weaving ratio, R	0.04	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	492	0	962	42	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	134	0	261	11	v
Trucks and buses	4	4	4	4	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	0.980	0.980	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	545	0	1066	46	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	3.05	0.48
Weaving and non-weaving speeds, Si	26.12	45.31
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.66

Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40  
Type of operation is Constrained

### Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	30.35	mph
Weaving segment density, D	18.20	pc/mi/ln
Level of service, LOS	B	
Capacity for base condition, cb	3928	pc/h

### Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	1112	2800	a
Average flow rate (pcphpl)	552	2250	b
Volume ratio, VR	0.67	0.45	c
Weaving ratio, R	0.04	N/A	d
Weaving length (ft)	580	2500	e

#### Notes:

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

Phone: Fax:  
 E-mail:

Merge Analysis

Analyst:  
 Agency/Co.:  
 Date performed: 5/28/2008  
 Analysis time period: Existing PM  
 Freeway/dir or travel: EB 262 at NB 680 off-ramp  
 Junction:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	533	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	642	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	962	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	385	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	533	642	962	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	145	174	261	v
Trucks and buses	4	4	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%

Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.980		0.980		0.980	
Driver population factor, fP	1.00		1.00		1.00	
Flow rate, vp	591		712		1067	pcp

Estimation of V12 Merge Areas

$L = 0.00$  (Equation 25-2 or 25-3)  
 $P = 1.000$  Using Equation 0  
 $v_{12} = v_F (P_{FM}) = 591$  pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{FO}$	1303	4500	No
$v_{R12}$	1303	4600	No

Level of Service Determination (if not F)

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 15.3$  pc/mi  
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M = 0.335$	
Space mean speed in ramp influence area,	$S_R = 50.6$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 50.6$	mph

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 5/28/2008  
 Analysis Time Period: Existing AM  
 Freeway/Direction: Major diverge to NB &SB 880  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Flow Inputs and Adjustments

---

Volume, V	2118	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	576	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, vp	1.00	
Flow rate, vp	1174	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	1174	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	21.3	pc/mi/ln
Level of service, LOS	C	

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

Phone:  
E-mail:

Fax:

Diverge Analysis

Analyst:  
Agency/Co.:  
Date performed: 5/28/2008  
Analysis time period: Existing PM  
Freeway/dir or travel: WB 262 Diverge to NB 680  
Junction:  
Jurisdiction:  
Analysis Year: 2008  
Description: SR 262 Improvement

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	490	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	15	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	590	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	530	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	490	15	590	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	133	4	160	v
Trucks and buses	4	4	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	%

Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.980		0.980		0.980	
Driver population factor, fP	1.00		1.00		1.00	
Flow rate, vp	543		17		654	pc/h

Estimation of V12 Diverge Areas

$L = 0.00$  (Equation 25-8 or 25-9)  
 $P = 1.000$  Using Equation 0  
 $v_{12R} = v_F + (v_F - v_R) P = 543$  pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	543	4500	No
$v_{12}$	543	4400	No
$v_{FO} = v_F - v_R$	526	4500	No
$v_R$	17	2100	No

Level of Service Determination (if not F)

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 8.9$  pc/mi/ft

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable,	$D = 0.365$	
Space mean speed in ramp influence area,	$S_R = 50$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 50.3$	mph

Phone: Fax:  
 E-mail:

Operational Analysis

Analyst:  
 Agency/Co.:  
 Date Performed: 5/28/2008  
 Analysis Time Period: Existing PM  
 Freeway/dir or Travel: WB 262 at 680  
 Weaving Location: NB 680 off to SB 680 on  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	550	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	Multilane or C-D
Volume ratio, VR	0.74	
Weaving ratio, R	0.25	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	278	0	197	590	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	76	0	54	160	v
Trucks and buses	4	4	4	4	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	0.980	0.980	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	308	0	218	654	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
Weaving intensity factor, Wi	2.50	0.38
Weaving and non-weaving speeds, Si	27.87	47.60
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.69



Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40  
 Type of operation is Constrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 31.25 mph  
 Weaving segment density, D 12.59 pc/mi/ln  
 Level of service, LOS B  
 Capacity for base condition, cb 3910 pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	872	2800	a
Average flow rate (pcphpl)	393	2250	b
Volume ratio, VR	0.74	0.45	c
Weaving ratio, R	0.25	N/A	d
Weaving length (ft)	550	2500	e

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

Phone: Fax:  
 E-mail:

Operational Analysis

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Analyst:  
 Agency or Company:  
 Date Performed: 5/28/2008  
 Analysis Time Period: Existing PM  
 Freeway/Direction: WB 262 at SB 680 off-ramp  
 From/To:  
 Jurisdiction:  
 Analysis Year: 2008  
 Description: SR 262 Improvement PSR

Flow Inputs and Adjustments

---

Volume, V	1857	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	465	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, vp	1.00	
Flow rate, vp	947	pc/h/ln

Speed Inputs and Adjustments

---

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h

Urban Freeway

LOS and Performance Measures

---

Flow rate, vp	947	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	17.2	pc/mi/ln
Level of service, LOS	B	

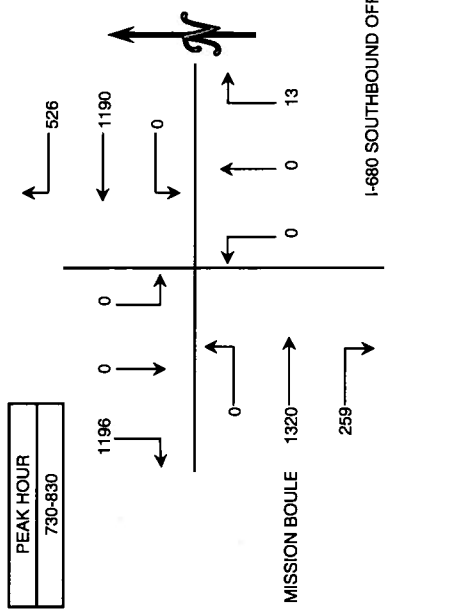
Overall results are not computed when free-flow speed is less than 55 mph.

## **Appendix C Traffic Counts**

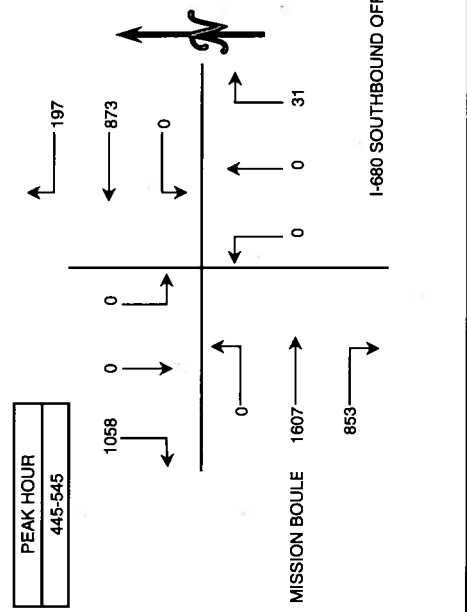
## INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: DKS ASSOCIATES  
 PROJECT: FREMONT GENERAL PLAN EIR  
 DATE: TUESDAY, FEBRUARY 5, 2008  
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM  
 INTERSECTION: N/S I-680 SOUTHBOUND OFF-RAMP AND  
 E/W MISSION BOULEVARD (SOUTH)  
 CITY: FREMONT

7:00 AM TO 9:00 AM													
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
700-715	225	0	0	67	178	0	2	0	0	47	230	0	749
715-730	278	0	0	72	230	0	9	0	0	51	277	0	917
730-745	296	0	0	92	265	0	1	0	0	45	315	0	1014
745-800	329	0	0	125	313	0	3	0	0	76	379	0	1225
800-815	303	0	0	142	288	0	2	0	0	74	309	0	1118
815-830	288	0	0	167	324	0	7	0	0	64	317	0	1147
830-845	224	0	0	147	250	0	9	0	0	74	284	0	988
845-900	239	0	0	109	218	0	4	0	0	63	212	0	845
<b>HOUR TOTALS</b>													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
700-800	1128	0	0	356	966	0	15	0	0	219	1201	0	3905
715-815	1206	0	0	431	1086	0	15	0	0	246	1280	0	4274
730-830	1196	0	0	526	1190	0	13	0	0	259	1320	0	4504
745-845	1124	0	0	581	1175	0	21	0	0	288	1289	0	4478
800-900	1034	0	0	565	1080	0	22	0	0	275	1122	0	4088



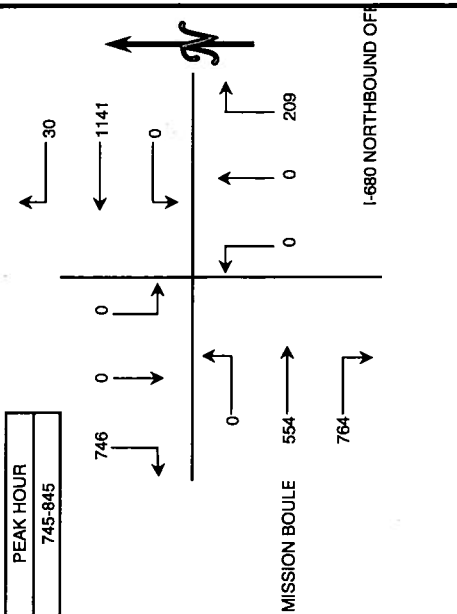
4:00 PM TO 6:00 PM													
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
400-415	218	0	0	25	116	0	65	0	0	160	266	0	850
415-430	206	0	0	49	155	0	17	0	0	143	367	0	937
430-445	246	0	0	43	217	0	6	0	0	209	347	0	1068
445-500	252	0	0	61	233	0	8	0	0	205	427	0	1186
500-515	265	0	0	48	188	0	11	0	0	220	397	0	1129
515-530	281	0	0	50	240	0	8	0	0	221	414	0	1214
530-545	260	0	0	38	212	0	4	0	0	207	369	0	1090
545-600	165	0	0	34	189	0	3	0	0	202	394	0	987
<b>HOUR TOTALS</b>													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
400-500	922	0	0	178	721	0	96	0	0	717	1407	0	4041
415-515	969	0	0	201	793	0	42	0	0	777	1538	0	4320
430-530	1044	0	0	202	878	0	33	0	0	855	1585	0	4597
445-545	1058	0	0	197	873	0	31	0	0	853	1607	0	4619
500-600	971	0	0	170	829	0	26	0	0	850	1574	0	4420



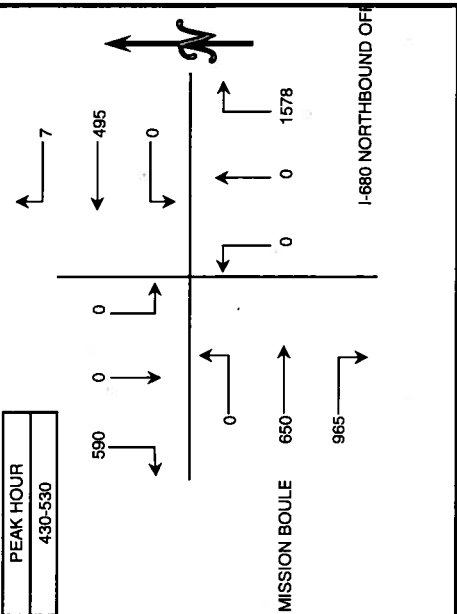
## INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: DKS ASSOCIATES  
 PROJECT: FREMONT GENERAL PLAN EIR  
 DATE: TUESDAY, FEBRUARY 5, 2008  
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM  
 INTERSECTION: N/S I-680 NORTHBOUND OFF-RAMP AND E/W MISSION BOULEVARD (SOUTH)  
 CITY: FREMONT

7:00 AM TO 9:00 AM													
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
700-715	90	0	0	5	147	0	9	0	0	67	122	0	440
715-730	107	0	0	5	164	0	12	0	0	89	113	0	490
730-745	139	0	0	7	198	0	19	0	0	125	168	0	656
745-800	189	0	0	6	235	0	25	0	0	139	172	0	766
800-815	177	0	0	7	276	0	47	0	0	201	150	0	858
815-830	175	0	0	11	300	0	66	0	0	211	132	0	895
830-845	205	0	0	6	330	0	71	0	0	213	100	0	925
845-900	172	0	0	4	291	0	38	0	0	175	75	0	755
<b>HOUR TOTALS</b>													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
700-800	525	0	0	23	744	0	65	0	0	420	575	0	2352
715-815	612	0	0	25	873	0	103	0	0	554	603	0	2770
730-830	680	0	0	31	1009	0	157	0	0	676	822	0	3175
745-845	746	0	0	30	1141	0	209	0	0	764	554	0	3444
800-900	729	0	0	28	1197	0	222	0	0	800	457	0	3433



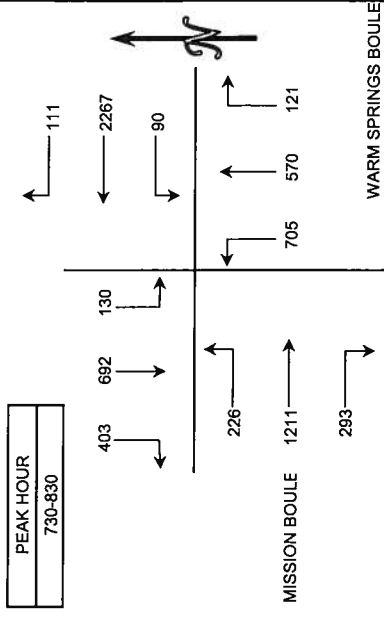
4:00 PM TO 6:00 PM													
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
400-415	142	0	0	3	106	0	185	0	0	223	95	0	754
415-430	129	0	0	1	115	0	303	0	0	214	111	0	873
430-445	137	0	0	1	120	0	389	0	0	231	141	0	1019
445-500	119	0	0	2	106	0	354	0	0	256	161	0	998
500-515	176	0	0	3	131	0	409	0	0	248	183	0	1150
515-530	158	0	0	1	138	0	426	0	0	230	165	0	1118
530-545	137	0	0	1	102	0	257	0	0	204	147	0	848
545-600	126	0	0	1	93	0	292	0	0	185	129	0	826
<b>HOUR TOTALS</b>													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
400-500	527	0	0	7	447	0	1231	0	0	924	508	0	3644
415-515	561	0	0	7	472	0	1455	0	0	949	596	0	4040
430-530	590	0	0	7	495	0	1578	0	0	965	650	0	4285
445-545	590	0	0	7	477	0	1446	0	0	938	656	0	4114
500-600	597	0	0	6	464	0	1384	0	0	867	624	0	3942



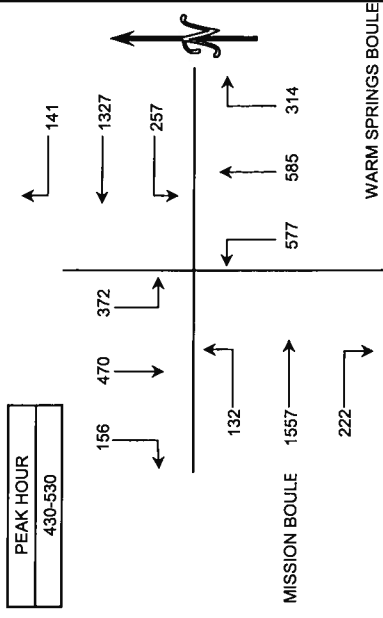
## INTERSECTION TURNING MOVEMENT COUNT SUMMARY

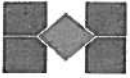
CLIENT: DKS ASSOCIATES  
 PROJECT: FREMONT GENERAL PLAN EIR  
 DATE: TUESDAY, FEBRUARY 5, 2008  
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM  
 INTERSECTION: N/S WARM SPRINGS BOULEVARD  
 E/W MISSION BOULEVARD  
 CITY: FREMONT

7:00 AM TO 9:00 AM													
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
700-715	93	100	29	39	648	25	23	101	144	68	231	36	1537
715-730	74	138	22	20	629	18	16	97	115	59	195	20	1403
730-745	81	150	30	31	586	24	21	122	149	59	234	57	1544
745-800	97	187	46	39	534	20	32	160	186	85	277	45	1708
800-815	123	201	32	25	606	28	42	171	202	82	359	76	1927
815-830	102	154	22	16	541	18	26	117	168	87	341	48	1640
830-845	122	123	38	13	514	17	30	114	184	56	209	35	1455
845-900	67	118	36	14	568	27	24	111	180	61	160	61	1427
<b>HOUR TOTALS</b>													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
700-800	345	575	127	129	2397	87	92	480	594	271	937	158	6192
715-815	375	676	130	115	2355	90	111	550	652	265	1065	198	6582
730-830	403	682	130	111	2267	90	121	570	705	293	1211	226	6819
745-845	444	665	138	93	2195	83	130	562	740	290	1186	204	6730
800-900	414	596	128	68	2229	90	122	513	734	266	1069	220	6449



4:00 PM TO 6:00 PM													
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
400-415	37	105	53	32	288	72	67	138	117	56	341	21	1327
415-430	44	112	74	42	330	76	87	119	131	55	353	34	1457
430-445	44	121	102	51	307	53	72	135	130	51	435	29	1530
445-500	45	121	85	41	351	66	68	149	147	68	400	33	1574
500-515	30	104	96	23	330	68	85	132	153	52	389	34	1496
515-530	37	124	89	26	339	70	89	169	147	51	333	36	1510
530-545	24	107	74	19	308	75	102	133	160	87	373	42	1504
545-600	22	120	73	24	350	63	81	179	162	73	359	41	1547
<b>HOUR TOTALS</b>													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
	SBRT	SBTH	SBLT	WBRT	WBTH	WBTL	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
400-500	170	459	314	166	1276	267	294	541	525	230	1529	117	5888
415-515	163	458	357	157	1318	263	312	535	561	226	1577	130	6057
430-530	156	470	372	141	1327	257	314	585	577	222	1557	132	6110
445-545	136	456	344	109	1328	279	344	583	607	258	1495	145	6084
500-600	113	455	332	92	1327	276	357	613	622	263	1454	153	6057

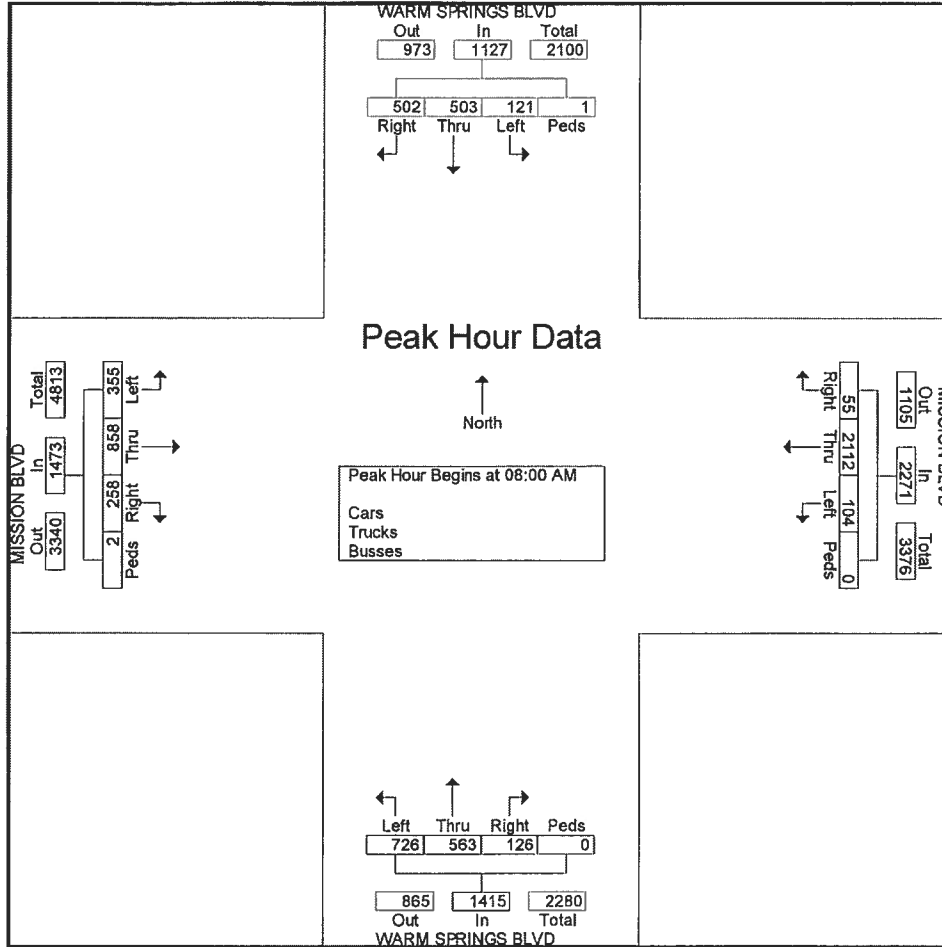


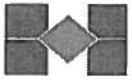


# Higgins Associates

Civil and Traffic Engineers  
 1300-B First Street  
 Gilroy, California 95020

File Name : 8-066-1  
 Site Code : 00000000  
 Start Date : 5/22/2008  
 Page No : 2

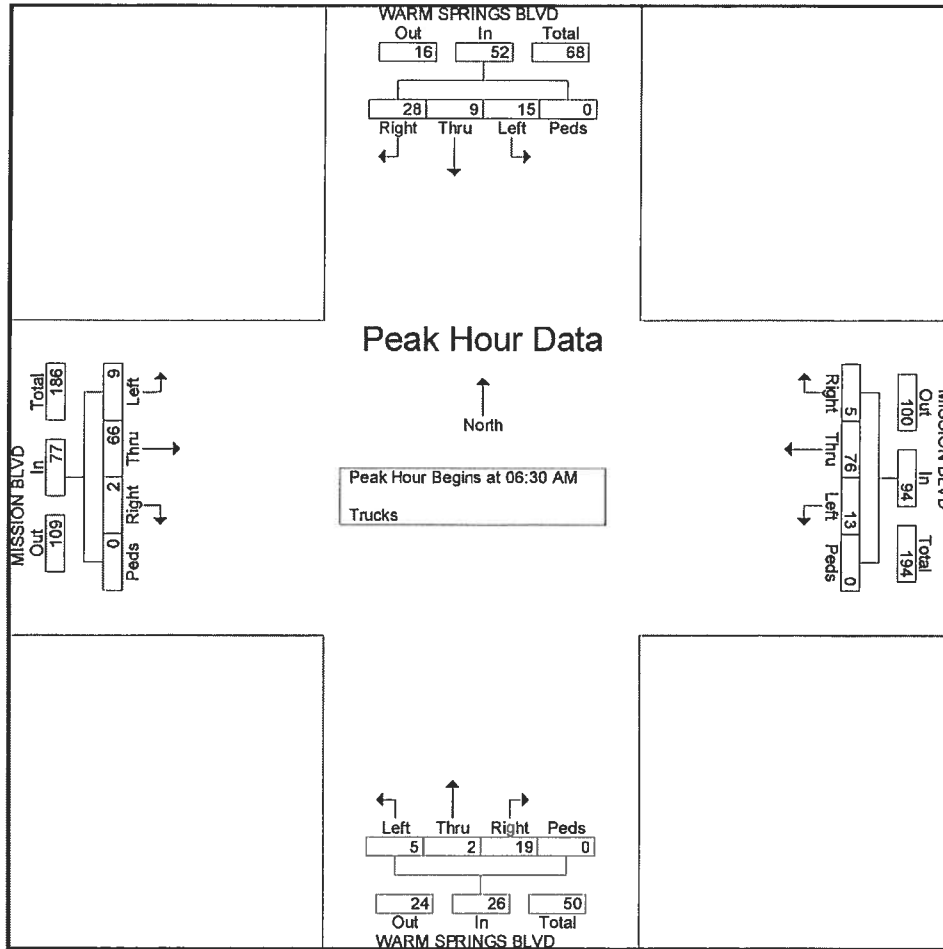




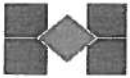
# Higgins Associates

Civil and Traffic Engineers  
1300-B First Street  
Gilroy, California 95020

File Name : 8-066-1  
Site Code : 00000000  
Start Date : 5/22/2008  
Page No : 2



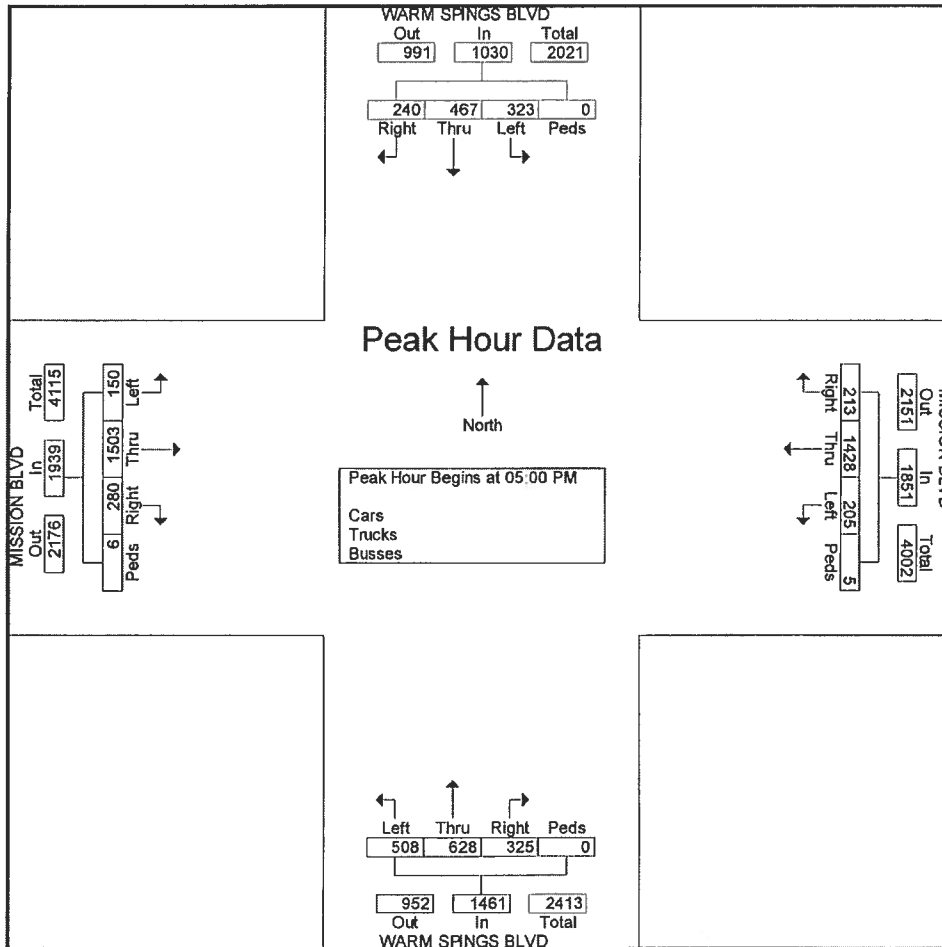


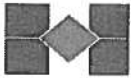


# Higgins Associates

Civil and Traffic Engineers  
 1300-B First Street  
 Gilroy, California 95020

File Name : 8-066-1K  
 Site Code : 00000000  
 Start Date : 5/21/2008  
 Page No : 2

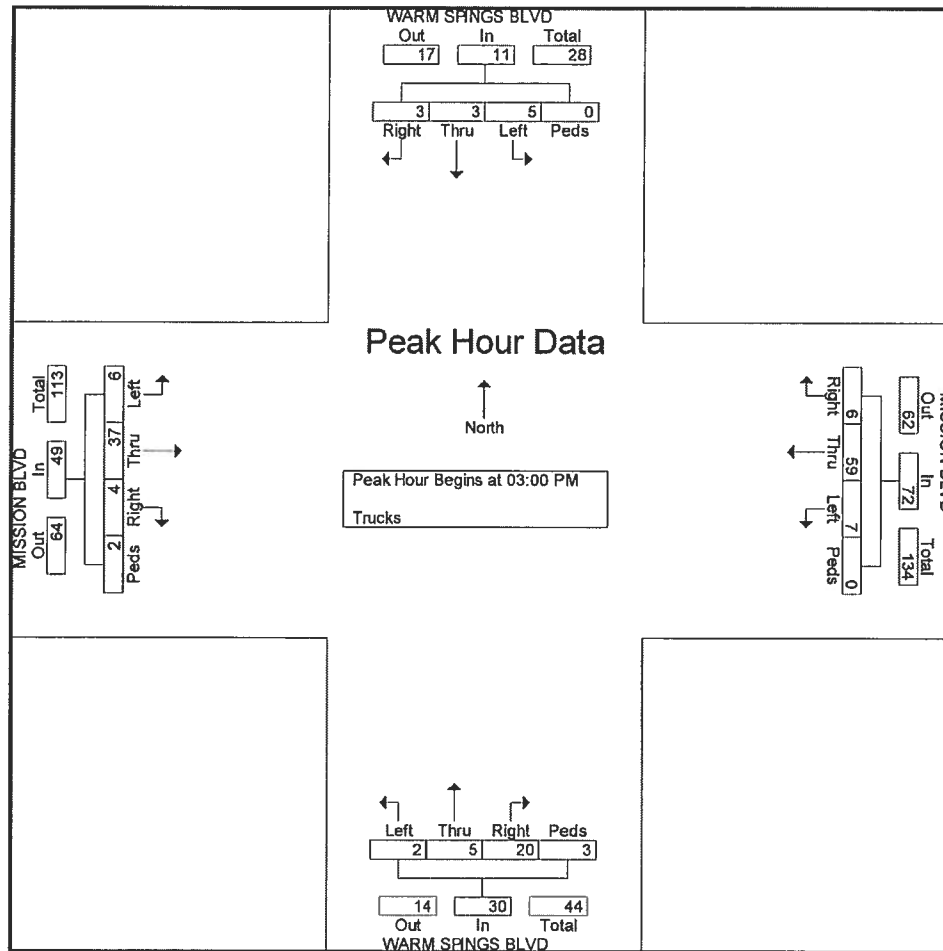




# Higgins Associates

Civil and Traffic Engineers  
1300-B First Street  
Gilroy, California 95020

File Name : 8-066-1K  
Site Code : 00000000  
Start Date : 5/21/2008  
Page No : 2

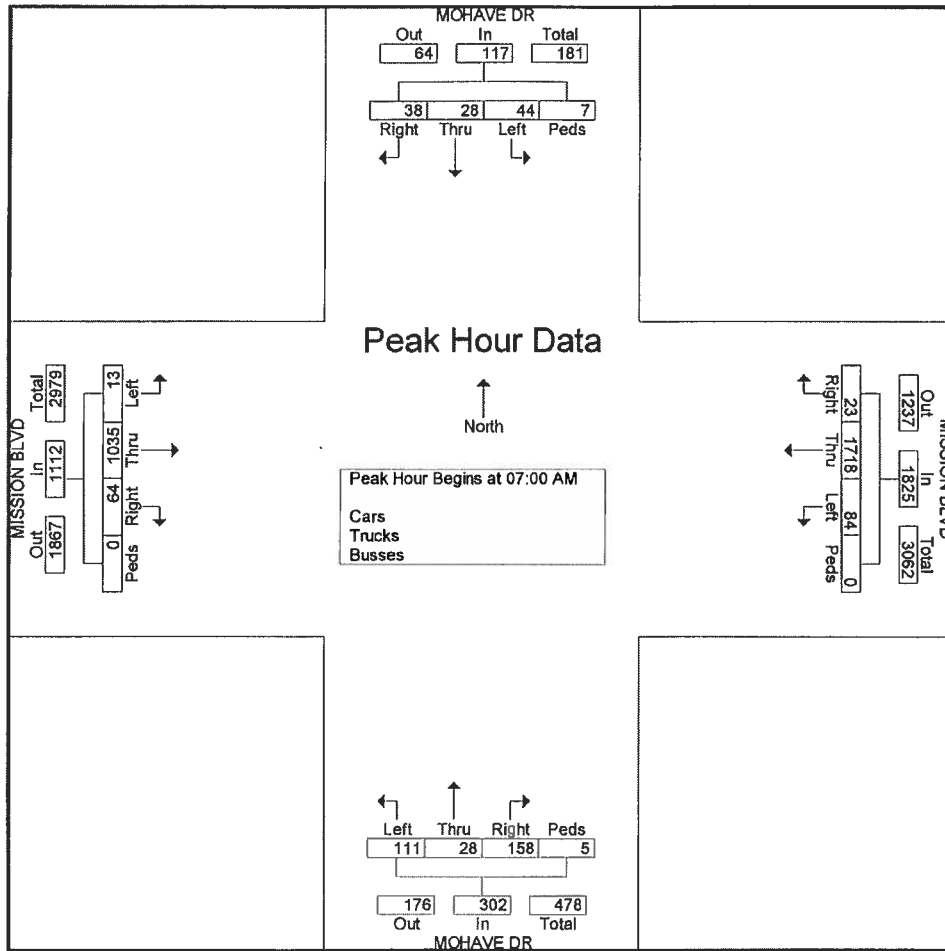




# Higgins Associates

Civil and Traffic Engineers  
 1300-B First Street  
 Gilroy, California 95020

File Name : 8-066-2E  
 Site Code : 00000000  
 Start Date : 5/22/2008  
 Page No : 2

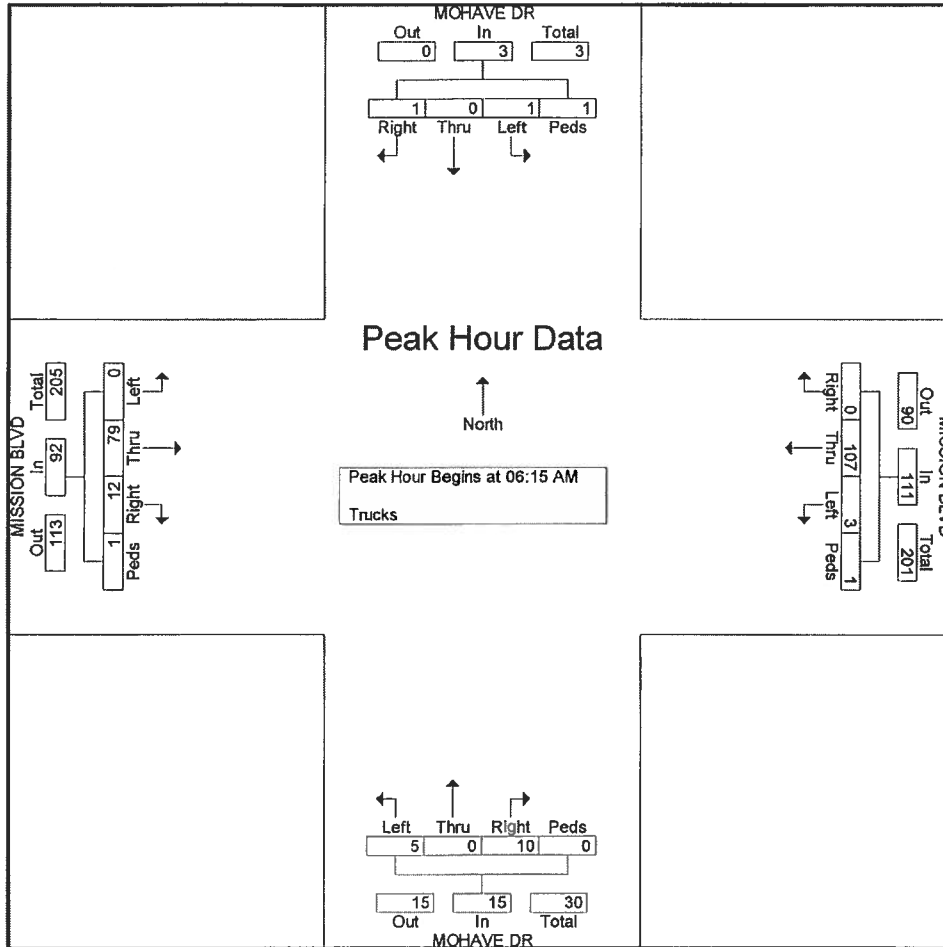


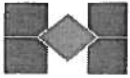


# Higgins Associates

Civil and Traffic Engineers  
 1300-B First Street  
 Gilroy, California 95020

File Name : 8-066-2E  
 Site Code : 00000000  
 Start Date : 5/22/2008  
 Page No : 2

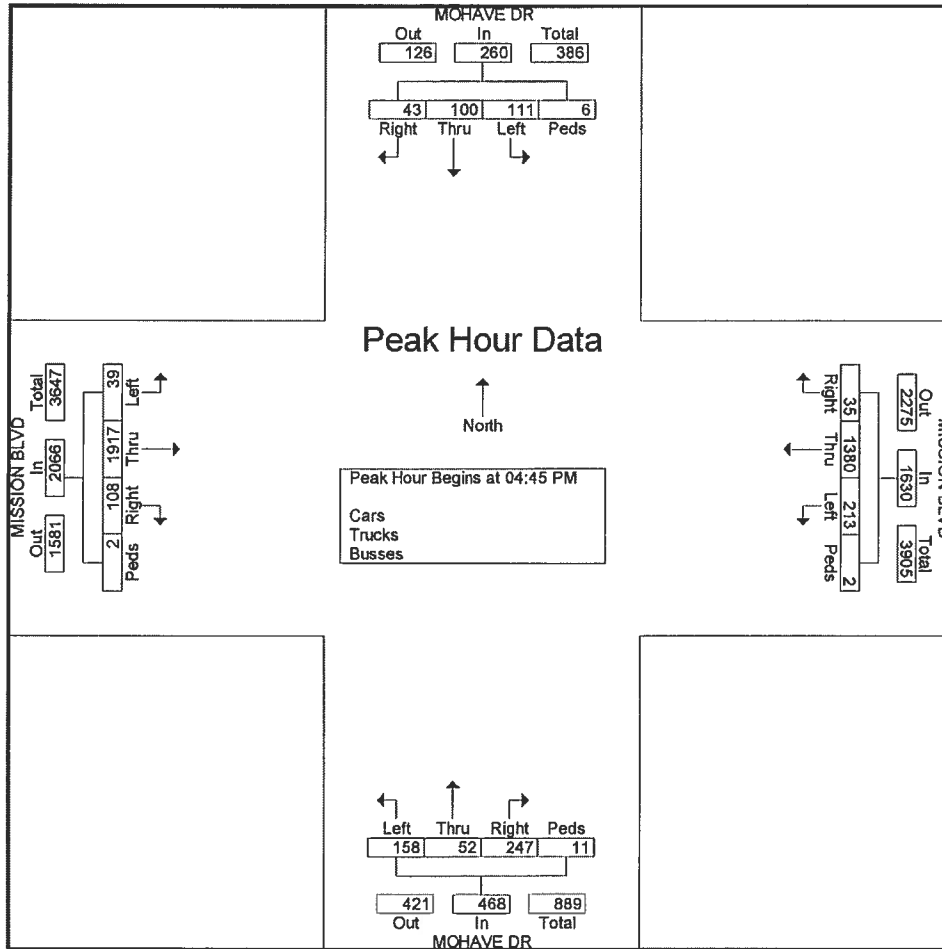




# Higgins Associates

Civil and Traffic Engineers  
1300-B First Street  
Gilroy, California 95020

File Name : 8-066-2F  
Site Code : 00000000  
Start Date : 5/21/2008  
Page No : 2

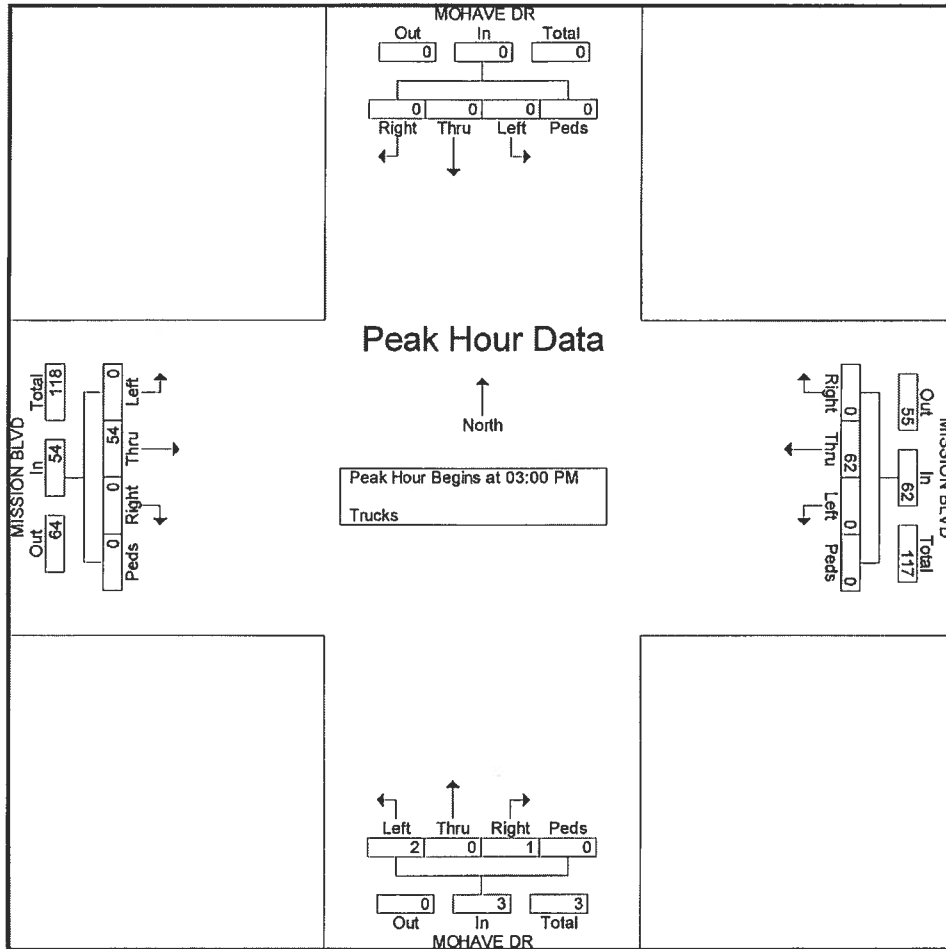




# Higgins Associates

Civil and Traffic Engineers  
 1300-B First Street  
 Gilroy, California 95020

File Name : 8-066-2F  
 Site Code : 00000000  
 Start Date : 5/21/2008  
 Page No : 2



MARKS TRAFFIC DATA

CITY OF FREMONT  
Bayside Market TIA

Mietek 916-806-0250

File Name : 880nb-fremont2-a  
Site Code : 28  
Start Date : 12/5/2007  
Page No : 1

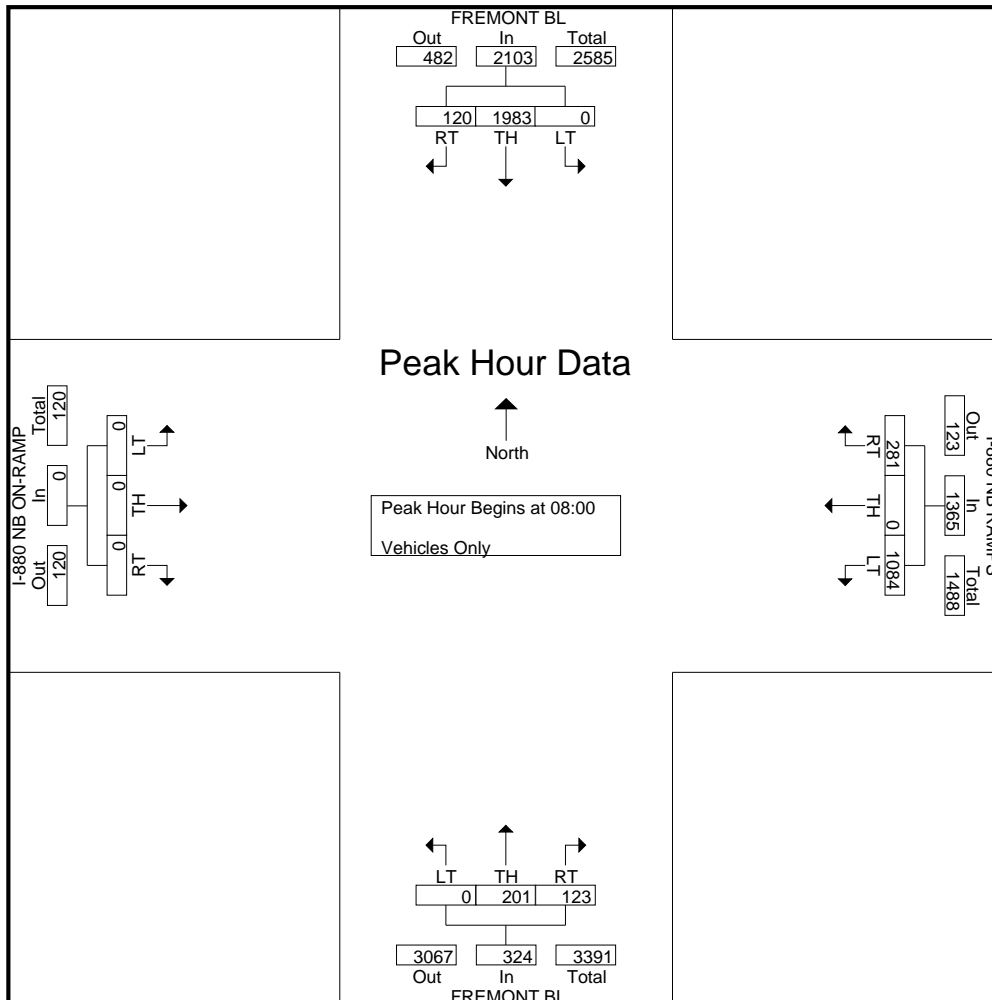
Groups Printed- Vehicles Only

Start Time	FREMONT BL Southbound				I-880 NB RAMPS Westbound				FREMONT BL Northbound				I-880 NB ON-RAMP Eastbound				Int. Total
	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	
07:00	24	148	0	172	48	0	171	219	32	51	0	83	0	0	0	0	474
07:15	29	182	0	211	74	0	185	259	29	56	0	85	0	0	0	0	555
07:30	32	254	0	286	75	0	228	303	34	50	0	84	0	0	0	0	673
07:45	32	359	0	391	85	0	284	369	35	74	0	109	0	0	0	0	869
Total	117	943	0	1060	282	0	868	1150	130	231	0	361	0	0	0	0	2571
08:00	23	411	0	434	68	0	252	320	22	60	0	82	0	0	0	0	836
08:15	29	531	0	560	66	0	262	328	36	52	0	88	0	0	0	0	976
08:30	38	493	0	531	80	0	288	368	34	44	0	78	0	0	0	0	977
08:45	30	548	0	578	67	0	282	349	31	45	0	76	0	0	0	0	1003
Total	120	1983	0	2103	281	0	1084	1365	123	201	0	324	0	0	0	0	3792
Grand Total	237	2926	0	3163	563	0	1952	2515	253	432	0	685	0	0	0	0	6363
Apprch %	7.5	92.5	0		22.4	0	77.6		36.9	63.1	0		0	0	0		
Total %	3.7	46	0	49.7	8.8	0	30.7	39.5	4	6.8	0	10.8	0	0	0	0	

Start Time	FREMONT BL Southbound				I-880 NB RAMPS Westbound				FREMONT BL Northbound				I-880 NB ON-RAMP Eastbound				Int. Total
	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	
08:00	23	411	0	434	68	0	252	320	22	<b>60</b>	0	82	0	0	0	0	836
08:15	29	531	0	560	66	0	262	328	<b>36</b>	52	0	<b>88</b>	0	0	0	0	976
08:30	<b>38</b>	493	0	531	<b>80</b>	0	<b>288</b>	<b>368</b>	34	44	0	78	0	0	0	0	977
08:45	30	<b>548</b>	0	<b>578</b>	67	0	282	349	31	45	0	76	0	0	0	0	<b>1003</b>
Total Volume	120	1983	0	2103	281	0	1084	1365	123	201	0	324	0	0	0	0	3792
% App. Total	5.7	94.3	0		20.6	0	79.4		38	62	0		0	0	0		
PHF	.789	.905	.000	.910	.878	.000	.941	.927	.854	.838	.000	.920	.000	.000	.000	.000	.945

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00



MARKS TRAFFIC DATA

CITY OF FREMONT  
Bayside Market TIA

Mietek 916-806-0250

File Name : 880nb-fremont2-p  
Site Code : 28  
Start Date : 12/5/2007  
Page No : 1

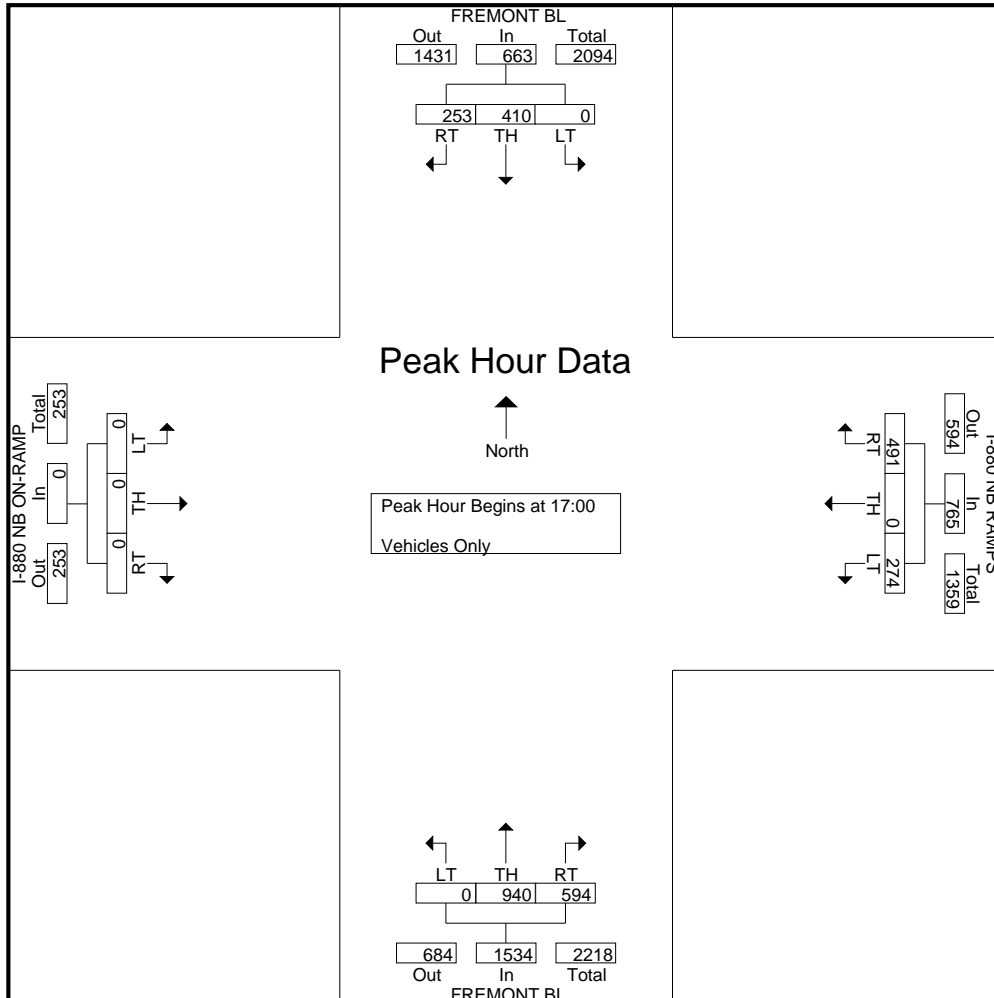
Groups Printed- Vehicles Only

Start Time	FREMONT BL Southbound				I-880 NB RAMPS Westbound				FREMONT BL Northbound				I-880 NB ON-RAMP Eastbound				Int. Total
	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	
16:00	94	135	0	229	164	0	69	233	123	281	0	404	0	0	0	0	866
16:15	69	86	0	155	138	0	61	199	84	195	0	279	0	0	0	0	633
16:30	147	106	0	253	119	0	48	167	124	174	0	298	0	0	0	0	718
16:45	68	101	0	169	104	0	62	166	78	124	0	202	0	0	0	0	537
Total	378	428	0	806	525	0	240	765	409	774	0	1183	0	0	0	0	2754
17:00	91	98	0	189	116	0	58	174	142	209	0	351	0	0	0	0	714
17:15	52	91	0	143	123	0	86	209	152	238	0	390	0	0	0	0	742
17:30	67	102	0	169	123	0	64	187	168	269	0	437	0	0	0	0	793
17:45	43	119	0	162	129	0	66	195	132	224	0	356	0	0	0	0	713
Total	253	410	0	663	491	0	274	765	594	940	0	1534	0	0	0	0	2962
Grand Total	631	838	0	1469	1016	0	514	1530	1003	1714	0	2717	0	0	0	0	5716
Approch %	43	57	0		66.4	0	33.6		36.9	63.1	0		0	0	0	0	
Total %	11	14.7	0	25.7	17.8	0	9	26.8	17.5	30	0	47.5	0	0	0	0	

Start Time	FREMONT BL Southbound				I-880 NB RAMPS Westbound				FREMONT BL Northbound				I-880 NB ON-RAMP Eastbound				Int. Total
	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	
17:00	<b>91</b>	98	0	<b>189</b>	116	0	58	174	142	209	0	351	0	0	0	0	714
17:15	52	91	0	143	123	0	<b>86</b>	<b>209</b>	152	238	0	390	0	0	0	0	742
17:30	67	102	0	169	123	0	64	187	<b>168</b>	<b>269</b>	0	<b>437</b>	0	0	0	0	<b>793</b>
17:45	43	<b>119</b>	0	162	<b>129</b>	0	66	195	132	224	0	356	0	0	0	0	713
Total Volume	253	410	0	663	491	0	274	765	594	940	0	1534	0	0	0	0	2962
% App. Total	38.2	61.8	0		64.2	0	35.8		38.7	61.3	0		0	0	0	0	
PHF	.695	.861	.000	.877	.952	.000	.797	.915	.884	.874	.000	.878	.000	.000	.000	.000	.934

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 17:00





MARKS TRAFFIC DATA

CITY OF FREMONT  
Bayside Market TIA

Mietek 916-806-0250

File Name : fremont-cushing2-a  
Site Code : 13  
Start Date : 11/15/2007  
Page No : 1

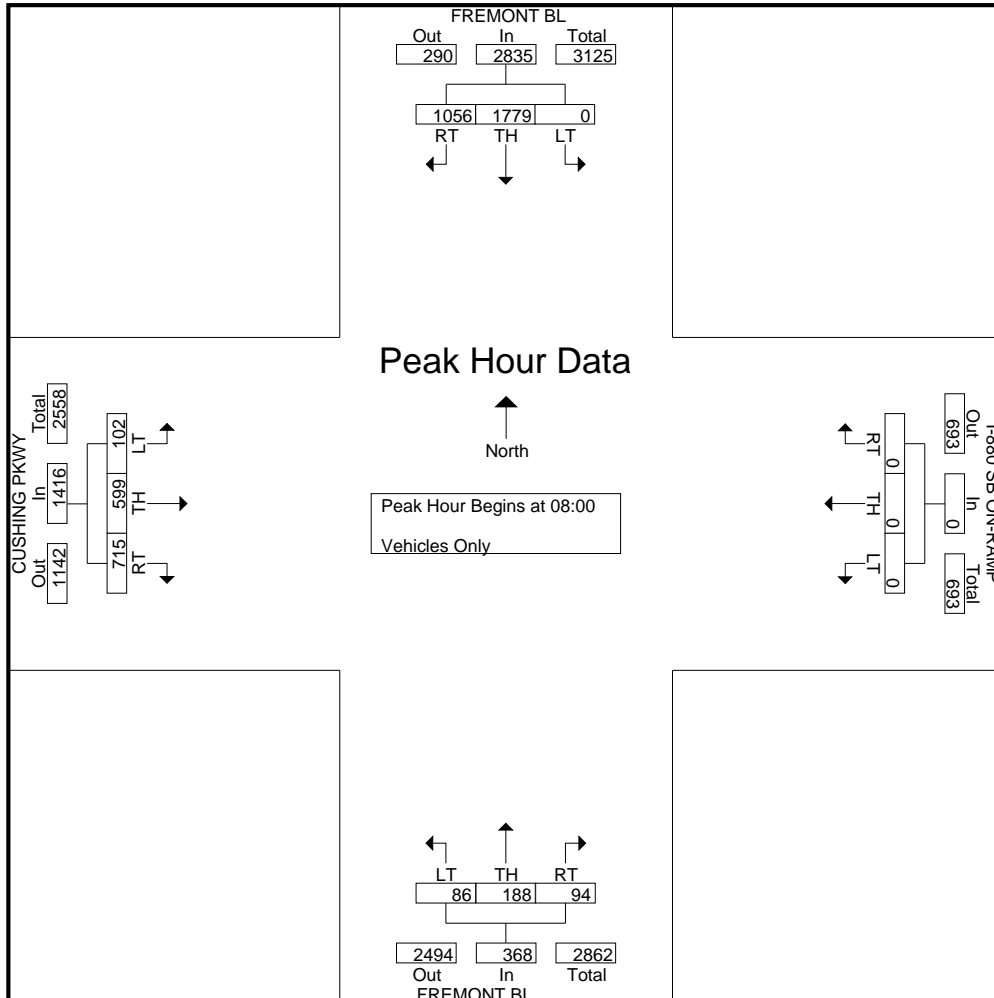
Groups Printed- Vehicles Only

Start Time	FREMONT BL Southbound				I-880 SB ON-RAMP Westbound				FREMONT BL Northbound				CUSHING PKWY Eastbound				Int. Total
	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	
07:00	132	243	0	375	0	0	0	0	28	24	14	66	65	39	12	116	557
07:15	152	239	0	391	0	0	0	0	23	32	23	78	83	75	25	183	652
07:30	179	304	0	483	0	0	0	0	20	41	23	84	133	116	23	272	839
07:45	218	393	0	611	0	0	0	0	22	34	19	75	167	119	23	309	995
Total	681	1179	0	1860	0	0	0	0	93	131	79	303	448	349	83	880	3043
08:00	258	370	0	628	0	0	0	0	30	41	23	94	167	119	16	302	1024
08:15	295	413	0	708	0	0	0	0	20	46	25	91	167	148	35	350	1149
08:30	248	409	0	657	0	0	0	0	23	46	20	89	205	174	26	405	1151
08:45	255	587	0	842	0	0	0	0	21	55	18	94	176	158	25	359	1295
Total	1056	1779	0	2835	0	0	0	0	94	188	86	368	715	599	102	1416	4619
Grand Total	1737	2958	0	4695	0	0	0	0	187	319	165	671	1163	948	185	2296	7662
Approch %	37	63	0		0	0	0	0	27.9	47.5	24.6		50.7	41.3	8.1		
Total %	22.7	38.6	0	61.3	0	0	0	0	2.4	4.2	2.2	8.8	15.2	12.4	2.4	30	

Start Time	FREMONT BL Southbound				I-880 SB ON-RAMP Westbound				FREMONT BL Northbound				CUSHING PKWY Eastbound				Int. Total
	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	
08:00	258	370	0	628	0	0	0	0	<b>30</b>	41	23	<b>94</b>	167	119	16	302	1024
08:15	<b>295</b>	413	0	708	0	0	0	0	20	46	<b>25</b>	91	167	148	<b>35</b>	350	1149
08:30	248	409	0	657	0	0	0	0	23	46	20	89	<b>205</b>	<b>174</b>	26	<b>405</b>	1151
08:45	255	<b>587</b>	0	<b>842</b>	0	0	0	0	21	<b>55</b>	18	94	176	158	25	359	<b>1295</b>
Total Volume	1056	1779	0	2835	0	0	0	0	94	188	86	368	715	599	102	1416	4619
% App. Total	37.2	62.8	0		0	0	0	0	25.5	51.1	23.4		50.5	42.3	7.2		
PHF	.895	.758	.000	.842	.000	.000	.000	.000	.783	.855	.860	.979	.872	.861	.729	.874	.892

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00



MARKS TRAFFIC DATA

CITY OF FREMONT  
Bayside Market TIA

Mietek 916-806-0250

File Name : fremont-cushing1-p  
Site Code : 13  
Start Date : 11/14/2007  
Page No : 1

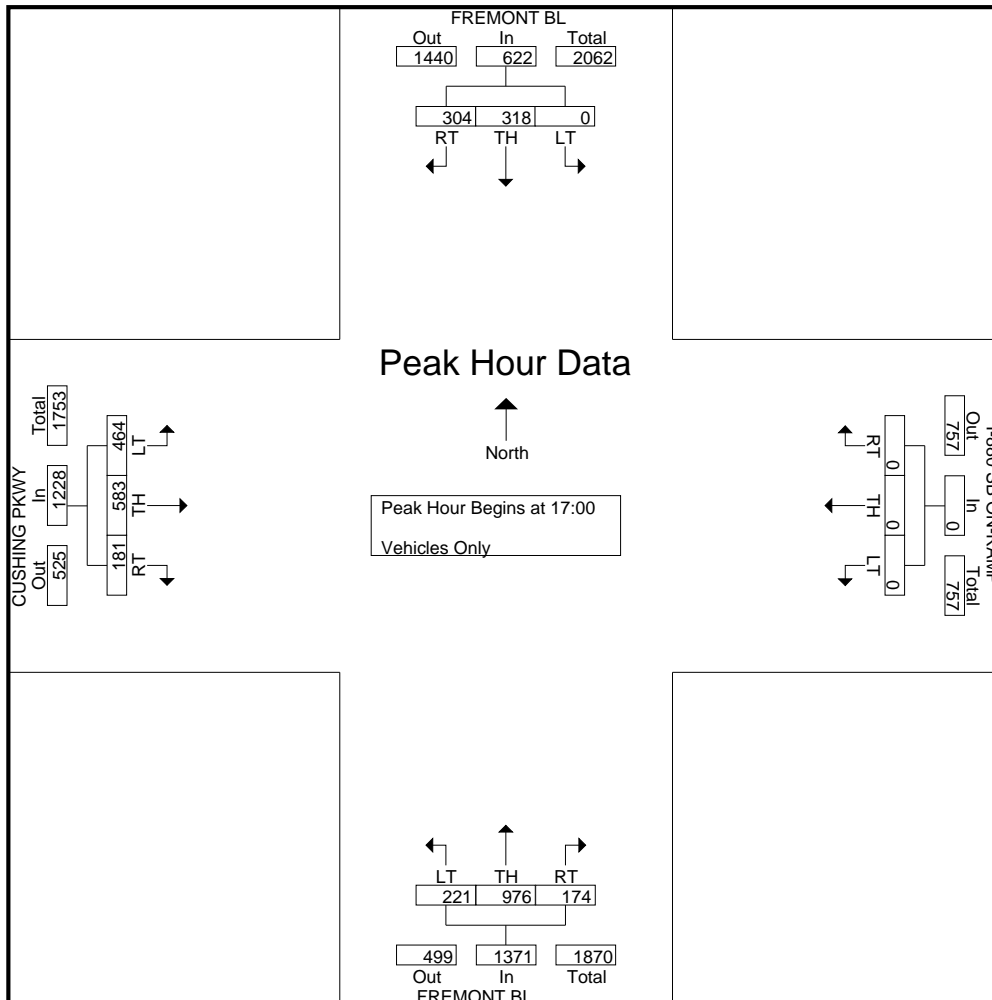
Groups Printed- Vehicles Only

Start Time	FREMONT BL Southbound				I-880 SB ON-RAMP Westbound				FREMONT BL Northbound				CUSHING PKWY Eastbound				Int. Total
	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	
16:00	79	77	0	156	0	0	0	0	28	179	29	236	38	110	102	250	642
16:15	49	64	0	113	0	0	0	0	25	124	27	176	22	72	69	163	452
16:30	67	74	0	141	0	0	0	0	51	199	40	290	32	94	78	204	635
16:45	56	73	0	129	0	0	0	0	36	149	33	218	37	110	82	229	576
Total	251	288	0	539	0	0	0	0	140	651	129	920	129	386	331	846	2305
17:00	51	75	0	126	0	0	0	0	47	266	58	371	57	139	112	308	805
17:15	62	76	0	138	0	0	0	0	42	215	66	323	52	160	143	355	816
17:30	83	90	0	173	0	0	0	0	53	246	53	352	36	140	106	282	807
17:45	108	77	0	185	0	0	0	0	32	249	44	325	36	144	103	283	793
Total	304	318	0	622	0	0	0	0	174	976	221	1371	181	583	464	1228	3221
Grand Total	555	606	0	1161	0	0	0	0	314	1627	350	2291	310	969	795	2074	5526
Approch %	47.8	52.2	0		0	0	0	0	13.7	71	15.3		14.9	46.7	38.3		
Total %	10	11	0	21	0	0	0	0	5.7	29.4	6.3	41.5	5.6	17.5	14.4	37.5	

Start Time	FREMONT BL Southbound				I-880 SB ON-RAMP Westbound				FREMONT BL Northbound				CUSHING PKWY Eastbound				Int. Total
	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	
17:00	51	75	0	126	0	0	0	0	47	<b>266</b>	58	<b>371</b>	<b>57</b>	139	112	308	805
17:15	62	76	0	138	0	0	0	0	42	215	<b>66</b>	323	52	<b>160</b>	<b>143</b>	<b>355</b>	<b>816</b>
17:30	83	<b>90</b>	0	173	0	0	0	0	<b>53</b>	246	53	352	36	140	106	282	807
17:45	<b>108</b>	77	0	<b>185</b>	0	0	0	0	32	249	44	325	36	144	103	283	793
Total Volume	304	318	0	622	0	0	0	0	174	976	221	1371	181	583	464	1228	3221
% App. Total	48.9	51.1	0		0	0	0	0	12.7	71.2	16.1		14.7	47.5	37.8		
PHF	.704	.883	.000	.841	.000	.000	.000	.000	.821	.917	.837	.924	.794	.911	.811	.865	.987

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 17:00





# Higgins Associates

Civil and Traffic Engineers  
 1300-B First Street  
 Gilroy, California 95020

Site Code: 000000000001  
 WB MISSION TO NB I-880

Start Time	Wed	21-May-0	Thu	22-May-0	Fri	23-May-0	Daily Average	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	*	*	31	199	37	*	34	199
12:15	*	*	26	218	22	*	24	218
12:30	*	*	21	181	14	*	18	181
12:45	*	174	15	182	13	*	14	178
01:00	*	204	24	194	16	*	20	199
01:15	*	170	9	182	14	*	12	176
01:30	*	171	27	199	32	*	30	185
01:45	*	204	10	200	11	*	10	202
02:00	*	181	6	203	16	*	11	192
02:15	*	193	20	184	19	*	20	188
02:30	*	244	16	261	27	*	22	252
02:45	*	225	14	218	13	*	14	222
03:00	*	253	21	241	22	*	22	247
03:15	*	229	22	205	18	*	20	217
03:30	*	244	15	229	20	*	18	236
03:45	*	210	11	205	26	*	18	208
04:00	*	229	24	234	21	*	22	232
04:15	*	186	31	221	32	*	32	204
04:30	*	252	47	230	60	*	54	241
04:45	*	249	52	262	54	*	53	256
05:00	*	269	80	263	88	*	84	266
05:15	*	259	119	248	119	*	119	254
05:30	*	241	181	289	171	*	176	265
05:45	*	280	196	257	159	*	178	268
06:00	*	229	164	258	134	*	149	244
06:15	*	245	214	222	210	*	212	234
06:30	*	200	263	215	228	*	246	208
06:45	*	213	246	193	223	*	234	203
07:00	*	170	247	210	250	*	248	190
07:15	*	177	248	152	245	*	246	164
07:30	*	138	286	126	278	*	282	132
07:45	*	119	283	142	282	*	282	130
08:00	*	103	263	124	232	*	248	114
08:15	*	110	230	116	*	*	230	113
08:30	*	119	222	97	*	*	222	108
08:45	*	93	221	91	*	*	221	92
09:00	*	96	213	109	*	*	213	102
09:15	*	97	207	108	*	*	207	102
09:30	*	114	194	100	*	*	194	107
09:45	*	146	172	127	*	*	172	136
10:00	*	88	176	98	*	*	176	93
10:15	*	73	173	79	*	*	173	76
10:30	*	66	171	60	*	*	171	63
10:45	*	41	178	47	*	*	178	44
11:00	*	45	151	45	*	*	151	45
11:15	*	41	150	42	*	*	150	42
11:30	*	55	158	59	*	*	158	57
11:45	*	41	219	37	*	*	219	39
Total	0	7486	6067	8162	3106	0	6007	8124
Combined Total	7486		14229		3106		14131	
Peak		05:00	07:15	04:45	07:00		07:00	05:00
Vol.		1049	1080	1062	1055		1058	1053
P.H.F.		0.937	0.944	0.919	0.935		0.938	0.982
ADT		ADT 14,229	AADT 14,229					



# Higgins Associates

Civil and Traffic Engineers

1300-B First Street  
Gilroy, California 95020

Site Code: 000000000002  
WB MISSION TO SB I-880

Start Time	Wed 21-May-0		Thu 22-May-0		Fri 23-May-0		Daily Average	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	*	*	33	338	92	*	62	338
12:15	*	*	35	356	51	*	43	356
12:30	*	*	36	372	46	*	41	372
12:45	*	156	22	342	46	*	34	249
01:00	*	355	43	423	36	*	40	389
01:15	*	368	34	394	29	*	32	381
01:30	*	398	32	371	26	*	29	384
01:45	*	411	29	361	35	*	32	386
02:00	*	337	14	380	23	*	18	358
02:15	*	320	34	355	56	*	45	338
02:30	*	336	52	360	49	*	50	348
02:45	*	312	45	299	38	*	42	306
03:00	*	309	38	354	47	*	42	332
03:15	*	240	43	303	51	*	47	272
03:30	*	316	78	328	102	*	90	322
03:45	*	309	112	311	131	*	122	310
04:00	*	297	91	325	108	*	100	311
04:15	*	266	151	332	131	*	141	299
04:30	*	301	207	323	178	*	192	312
04:45	*	310	241	321	194	*	218	316
05:00	*	328	273	319	224	*	248	324
05:15	*	293	351	318	286	*	318	306
05:30	*	318	440	283	346	*	393	300
05:45	*	270	469	287	448	*	458	278
06:00	*	245	483	286	422	*	452	266
06:15	*	288	476	288	414	*	445	288
06:30	*	241	515	296	500	*	508	268
06:45	*	228	538	275	517	*	528	252
07:00	*	271	546	238	453	*	500	254
07:15	*	196	542	243	578	*	560	220
07:30	*	184	520	254	501	*	510	219
07:45	*	186	553	183	545	*	549	184
08:00	*	178	581	163	587	*	584	170
08:15	*	177	616	164	*	*	616	170
08:30	*	151	626	178	*	*	626	164
08:45	*	133	653	166	*	*	653	150
09:00	*	111	630	173	*	*	630	142
09:15	*	177	552	143	*	*	552	160
09:30	*	133	563	139	*	*	563	136
09:45	*	153	571	131	*	*	571	142
10:00	*	119	523	117	*	*	523	118
10:15	*	116	470	97	*	*	470	106
10:30	*	143	450	110	*	*	450	126
10:45	*	110	415	123	*	*	415	116
11:00	*	97	395	111	*	*	395	104
11:15	*	79	403	110	*	*	403	94
11:30	*	72	390	88	*	*	390	80
11:45	*	83	368	103	*	*	368	93
Total	0	10421	15282	12334	7290	0	15098	11909
Combined Total	10421		27616		7290		27007	
Peak	01:00		08:15	01:00	07:15	08:15		01:00
Vol.	1532		2525	1549	2211	2525		1540
P.H.F.	0.932		0.967	0.915	0.942	0.967		0.990
ADT	ADT 27,616		AADT 27,616					



# Higgins Associates

Civil and Traffic Engineers  
 1300-B First Street  
 Gilroy, California 95020

Site Code: 000000000003  
 SB I-880 OFF RAMP TO W. WARREN

Start Time	Wed	21-May-0	Thu	22-May-0	Fri	23-May-0	Daily Average	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	*	*	1	22	3	*	2	22
12:15	*	*	4	44	3	*	4	44
12:30	*	*	4	37	3	*	4	37
12:45	*	*	1	49	3	*	2	49
01:00	*	*	1	45	2	*	2	45
01:15	*	44	2	36	1	*	2	40
01:30	*	34	1	34	2	*	2	34
01:45	*	38	1	43	4	*	2	40
02:00	*	43	2	57	0	*	1	50
02:15	*	52	2	39	1	*	2	46
02:30	*	33	0	27	2	*	1	30
02:45	*	43	0	39	3	*	2	41
03:00	*	40	2	28	2	*	2	34
03:15	*	41	1	32	3	*	2	36
03:30	*	23	4	26	11	*	8	24
03:45	*	27	18	33	30	*	24	30
04:00	*	23	4	21	3	*	4	22
04:15	*	16	3	20	5	*	4	18
04:30	*	14	10	20	9	*	10	17
04:45	*	25	9	23	18	*	14	24
05:00	*	27	6	22	10	*	8	24
05:15	*	30	10	20	7	*	8	25
05:30	*	14	24	27	18	*	21	20
05:45	*	27	54	25	39	*	46	26
06:00	*	16	17	23	14	*	16	20
06:15	*	26	18	17	16	*	17	22
06:30	*	20	26	29	18	*	22	24
06:45	*	34	32	31	29	*	30	32
07:00	*	23	27	18	22	*	24	20
07:15	*	32	24	19	26	*	25	26
07:30	*	19	16	18	25	*	20	18
07:45	*	24	16	27	29	*	22	26
08:00	*	14	21	15	33	*	27	14
08:15	*	29	21	17	31	*	26	23
08:30	*	18	21	12	*	*	21	15
08:45	*	17	11	15	*	*	11	16
09:00	*	20	24	24	*	*	24	22
09:15	*	17	16	13	*	*	16	15
09:30	*	11	20	12	*	*	20	12
09:45	*	10	13	13	*	*	13	12
10:00	*	11	23	15	*	*	23	13
10:15	*	9	14	6	*	*	14	8
10:30	*	6	20	8	*	*	20	7
10:45	*	6	26	7	*	*	26	6
11:00	*	6	22	8	*	*	22	7
11:15	*	2	18	4	*	*	18	3
11:30	*	8	30	5	*	*	30	6
11:45	*	3	38	6	*	*	38	4
Total	0	975	678	1131	425	0	702	1149
Combined Total	975		1809		425		1851	
Peak		02:00	05:45	00:15	07:30		11:00	00:15
Vol.		171	115	175	118		108	175
P.H.F.		0.822	0.532	0.893	0.894		0.711	0.893
ADT	ADT 1,809		AADT 1,809					



# Higgins Associates

Civil and Traffic Engineers

1300-B First Street  
Gilroy, California 95020

Site Code: 000000000004  
EB GATEWAY TO SB I-880

Start Time	Wed	21-May-0	Thu	22-May-0	Fri	23-May-0	Daily Average	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	*	*	26	114	0	*	13	114
12:15	*	*	7	78	0	*	4	78
12:30	*	*	14	68	0	*	7	68
12:45	*	*	13	72	0	*	6	72
01:00	*	*	24	58	0	*	12	58
01:15	*	*	18	56	0	*	9	56
01:30	*	60	5	81	0	*	2	70
01:45	*	56	1	68	0	*	0	62
02:00	*	82	8	73	0	*	4	78
02:15	*	68	3	74	0	*	2	71
02:30	*	158	5	160	0	*	2	159
02:45	*	94	1	86	0	*	0	90
03:00	*	115	2	116	0	*	1	116
03:15	*	93	2	77	0	*	1	85
03:30	*	169	2	200	0	*	1	184
03:45	*	110	3	118	0	*	2	114
04:00	*	141	3	135	0	*	2	138
04:15	*	115	2	107	0	*	1	111
04:30	*	172	5	210	0	*	2	191
04:45	*	159	10	168	0	*	5	164
05:00	*	261	2	283	0	*	1	272
05:15	*	209	3	192	0	*	2	200
05:30	*	209	7	166	0	*	4	188
05:45	*	164	10	0	0	*	5	82
06:00	*	239	13	0	0	*	6	120
06:15	*	166	14	0	0	*	7	83
06:30	*	152	22	0	0	*	11	76
06:45	*	125	49	0	0	*	24	62
07:00	*	106	59	0	0	*	30	53
07:15	*	102	93	0	0	*	46	51
07:30	*	77	132	0	0	*	66	38
07:45	*	56	160	0	0	*	80	28
08:00	*	51	137	0	0	*	68	26
08:15	*	43	172	0	0	*	86	22
08:30	*	30	188	0	0	*	94	15
08:45	*	20	179	0	*	*	179	10
09:00	*	22	147	0	*	*	147	11
09:15	*	18	162	0	*	*	162	9
09:30	*	20	155	0	*	*	155	10
09:45	*	16	115	0	*	*	115	8
10:00	*	16	88	0	*	*	88	8
10:15	*	22	79	0	*	*	79	11
10:30	*	16	80	0	*	*	80	8
10:45	*	16	67	0	*	*	67	8
11:00	*	32	58	0	*	*	58	16
11:15	*	20	76	0	*	*	76	10
11:30	*	15	110	0	*	*	110	8
11:45	*	9	99	0	*	*	99	4
Total	0	3824	2630	2760	0	0	2021	3516
Combined Total	3824		5390		0		5537	
Peak		05:00	08:15	04:30			08:45	04:30
Vol.		843	686	853			643	827
P.H.F.		0.807	0.912	0.754			0.898	0.760
ADT		ADT 5,390	AADT 5,390					



# Higgins Associates

Civil and Traffic Engineers

1300-B First Street  
Gilroy, California 95020

Site Code: 000000000005  
WB MISSION TO GATEWAY

Start Time	Wed	21-May-0	Thu	22-May-0	Fri	23-May-0	Daily Average	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	*	*	1	0	2	*	2	0
12:15	*	*	1	3	2	*	2	3
12:30	*	*	3	0	0	*	2	0
12:45	*	*	2	1	1	*	2	1
01:00	*	*	3	0	0	*	2	0
01:15	*	*	0	0	0	*	0	0
01:30	*	53	1	1	0	*	0	27
01:45	*	89	0	0	1	*	0	44
02:00	*	72	0	0	0	*	0	36
02:15	*	64	0	0	0	*	0	32
02:30	*	64	3	0	1	*	2	32
02:45	*	54	0	0	2	*	1	27
03:00	*	52	3	0	3	*	3	26
03:15	*	30	2	0	0	*	1	15
03:30	*	38	13	0	2	*	8	19
03:45	*	33	26	0	3	*	14	16
04:00	*	34	3	0	4	*	4	17
04:15	*	28	4	0	2	*	3	14
04:30	*	29	7	0	4	*	6	14
04:45	*	39	15	0	10	*	12	20
05:00	*	41	17	1	8	*	12	21
05:15	*	40	22	0	10	*	16	20
05:30	*	33	50	1	25	*	38	17
05:45	*	38	116	2	49	*	82	20
06:00	*	23	50	1	31	*	40	12
06:15	*	44	68	1	33	*	50	22
06:30	*	30	92	8	52	*	72	19
06:45	*	18	141	7	79	*	110	12
07:00	*	27	101	4	39	*	70	16
07:15	*	19	106	12	54	*	80	16
07:30	*	13	117	7	47	*	82	10
07:45	*	22	82	15	51	*	66	18
08:00	*	30	40	7	51	*	46	18
08:15	*	18	44	13	72	*	58	16
08:30	*	16	37	10	52	*	44	13
08:45	*	14	39	12	*	*	39	13
09:00	*	18	36	14	*	*	36	16
09:15	*	28	16	14	*	*	16	21
09:30	*	9	9	8	*	*	9	8
09:45	*	17	13	11	*	*	13	14
10:00	*	16	8	3	*	*	8	10
10:15	*	2	5	4	*	*	5	3
10:30	*	8	7	8	*	*	7	8
10:45	*	9	1	6	*	*	1	8
11:00	*	2	2	5	*	*	2	4
11:15	*	6	0	1	*	*	0	4
11:30	*	5	3	1	*	*	3	3
11:45	*	5	1	2	*	*	1	4
Total	0	1230	1310	183	690	0	1070	709
Combined Total	1230		1493		690		1779	
Peak		01:45	06:45	08:30	07:45		06:45	01:45
Vol.		289	465	50	226		342	144
P.H.F.		0.812	0.824	0.893	0.715		0.777	0.818
ADT		ADT 1,493	AADT 1,493					



# Higgins Associates

Civil and Traffic Engineers  
 1300-B First Street  
 Gilroy, California 95020

Site Code: 6  
 NB,SB I-880 OFF RAMP TO MISSION

Start Time	21-May-0 Wed	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		*	*			*	*				
12:15		*	*			*	*				
12:30		*	*			*	*				
12:45		*	*	0	0	*	*	0	0	0	0
01:00		*	*			*	*				
01:15		*	*			*	*				
01:30		*	*			*	*				
01:45		*	*	0	0	*	*	0	0	0	0
02:00		*	163			*	349				
02:15		*	121			*	373				
02:30		*	155			*	374				
02:45		*	35	0	474	*	354	0	1450	0	1924
03:00		*	3			*	343				
03:15		*	4			*	346				
03:30		*	2			*	343				
03:45		*	6	0	15	*	299	0	1331	0	1346
04:00		*	10			*	352				
04:15		*	17			*	340				
04:30		*	8			*	294				
04:45		*	2	0	37	*	308	0	1294	0	1331
05:00		*	31			*	281				
05:15		*	39			*	276				
05:30		*	36			*	259				
05:45		*	31	0	137	*	292	0	1108	0	1245
06:00		*	42			*	261				
06:15		*	32			*	304				
06:30		*	29			*	301				
06:45		*	17	0	120	*	297	0	1163	0	1283
07:00		*	21			*	339				
07:15		*	31			*	346				
07:30		*	19			*	410				
07:45		*	15	0	86	*	375	0	1470	0	1556
08:00		*	22			*	357				
08:15		*	18			*	288				
08:30		*	4			*	273				
08:45		*	9	0	53	*	279	0	1197	0	1250
09:00		*	17			*	244				
09:15		*	4			*	282				
09:30		*	15			*	223				
09:45		*	15	0	51	*	241	0	990	0	1041
10:00		*	11			*	230				
10:15		*	11			*	205				
10:30		*	11			*	178				
10:45		*	8	0	41	*	156	0	769	0	810
11:00		*	8			*	126				
11:15		*	2			*	124				
11:30		*	6			*	122				
11:45		*	10	0	26	*	79	0	451	0	477
Total		0	1040			0	11223			0	12263
Percent		0.0%	100.0%			0.0%	100.0%			0.0%	100.0%





# Higgins Associates

Civil and Traffic Engineers

1300-B First Street  
 Gilroy, California 95020

Site Code: 6  
 NB,SB I-880 OFF RAMP TO MISSION

Start Time	22-May-0 Thu	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		4	41			71	265				
12:15		6	35			61	300				
12:30		5	21			53	321				
12:45		0	27	15	124	47	340	232	1226	247	1350
01:00		2	16			42	351				
01:15		7	8			40	368				
01:30		1	30			37	370				
01:45		4	13	14	67	42	347	161	1436	175	1503
02:00		2	1			14	375				
02:15		4	1			32	385				
02:30		3	2			37	340				
02:45		2	1	11	5	29	363	112	1463	123	1468
03:00		8	1			41	343				
03:15		2	4			12	366				
03:30		1	2			29	344				
03:45		5	1	16	8	40	330	122	1383	138	1391
04:00		2	16			35	337				
04:15		7	14			41	351				
04:30		8	10			66	370				
04:45		5	2	22	42	52	304	194	1362	216	1404
05:00		7	4			100	332				
05:15		10	11			113	299				
05:30		6	27			140	308				
05:45		10	30	33	72	194	302	547	1241	580	1313
06:00		14	27			179	298				
06:15		12	32			231	319				
06:30		16	11			229	330				
06:45		16	11	58	81	262	360	901	1307	959	1388
07:00		11	1			262	344				
07:15		5	1			313	354				
07:30		15	3			299	408				
07:45		11	8	42	13	311	355	1185	1461	1227	1474
08:00		13	11			277	349				
08:15		13	16			301	336				
08:30		13	14			327	301				
08:45		10	12	49	53	308	312	1213	1298	1262	1351
09:00		14	7			262	275				
09:15		24	11			282	237				
09:30		13	14			325	290				
09:45		19	16	70	48	319	262	1188	1064	1258	1112
10:00		21	9			277	297				
10:15		14	7			247	294				
10:30		20	10			232	196				
10:45		20	5	75	31	260	152	1016	939	1091	970
11:00		23	4			273	138				
11:15		23	7			296	154				
11:30		26	3			257	125				
11:45		24	9	96	23	312	97	1138	514	1234	537
Total		501	567			8009	14694			8510	15261
Percent		46.9%	53.1%			35.3%	64.7%			35.8%	64.2%



# Higgins Associates

Civil and Traffic Engineers

1300-B First Street  
 Gilroy, California 95020

Site Code: 6  
 NB,SB I-880 OFF RAMP TO MISSION

Start Time	23-May-0 Fri	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		7	*			90	*				
12:15		3	*			68	*				
12:30		3	*			67	*				
12:45		3	*	16	0	79	*	304	0	320	0
01:00		2	*			54	*				
01:15		2	*			49	*				
01:30		3	*			44	*				
01:45		2	*	9	0	38	*	185	0	194	0
02:00		7	*			35	*				
02:15		1	*			27	*				
02:30		1	*			39	*				
02:45		4	*	13	0	37	*	138	0	151	0
03:00		3	*			29	*				
03:15		2	*			33	*				
03:30		4	*			29	*				
03:45		5	*	14	0	50	*	141	0	155	0
04:00		8	*			50	*				
04:15		6	*			44	*				
04:30		5	*			62	*				
04:45		6	*	25	0	76	*	232	0	257	0
05:00		9	*			80	*				
05:15		5	*			125	*				
05:30		6	*			129	*				
05:45		7	*	27	0	186	*	520	0	547	0
06:00		11	*			190	*				
06:15		8	*			217	*				
06:30		17	*			204	*				
06:45		18	*	54	0	219	*	830	0	884	0
07:00		9	*			239	*				
07:15		13	*			234	*				
07:30		18	*			281	*				
07:45		17	*	57	0	317	*	1071	0	1128	0
08:00		29	*			298	*				
08:15		38	*			294	*				
08:30		35	*			318	*				
08:45		27	*	129	0	287	*	1197	0	1326	0
09:00		*	*			*	*				
09:15		*	*	*	*	*	*	*	*	*	*
09:30		*	*	*	*	*	*	*	*	*	*
09:45		*	*	*	*	*	*	*	*	*	*
10:00		*	*	*	*	*	*	*	*	*	*
10:15		*	*	*	*	*	*	*	*	*	*
10:30		*	*	*	*	*	*	*	*	*	*
10:45		*	*	*	*	*	*	*	*	*	*
11:00		*	*	*	*	*	*	*	*	*	*
11:15		*	*	*	*	*	*	*	*	*	*
11:30		*	*	*	*	*	*	*	*	*	*
11:45		*	*	*	*	*	*	*	*	*	*
Total		344	0			4618	0			4962	0
Percent		100.0%	0.0%			100.0%	0.0%			100.0%	0.0%
Grand Total		845	1607			12627	25917			13472	27524
Percent		34.5%	65.5%			32.8%	67.2%			32.9%	67.1%
ADT		ADT 23,771				AADT 23,771					

# WILTEC

Phone: (626) 564-1944

Fax: (626) 564-0969

## 24-HOUR ADT COUNT SUMMARY

CLIENT: DKS ASSOCIATES  
 PROJECT: RT 262/MISSION BOULEVARD COUNTS  
 LOCATION: MISSION BLVD BETWEEN I-680 NB RAMPS  
 AND CURTNER ROAD  
 DATE: MONDAY, JUNE 2, 2008

DIRECTION:		EB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	14	11	13	9	47	
1:00	6	8	10	5	29	
2:00	2	5	4	5	16	
3:00	4	4	5	2	15	
4:00	3	2	1	5	11	
5:00	2	2	8	15	27	
6:00	16	31	38	44	129	
7:00	44	53	52	101	250	
8:00	61	98	68	64	291	
9:00	66	54	58	72	250	
10:00	58	67	60	56	241	
11:00	84	87	108	90	369	
12:00	99	104	83	91	377	
13:00	90	91	104	94	379	
14:00	100	118	112	150	480	
15:00	131	150	137	148	566	
16:00	162	186	160	218	726	
17:00	218	266	269	276	1029	
18:00	258	250	269	265	1042	
19:00	222	208	184	164	778	
20:00	150	124	124	127	525	
21:00	122	86	92	88	388	
22:00	72	48	40	34	194	
23:00	36	27	25	21	109	
				TOTAL	8268	
AM PEAK HOUR		1100-1200				
VOLUME		369				
PM PEAK HOUR		1715-1815				
VOLUME		1069				

DIRECTION:		WB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	7	10	6	2	25	
1:00	6	3	0	3	12	
2:00	2	2	1	4	9	
3:00	4	4	1	5	14	
4:00	2	9	5	10	26	
5:00	17	15	28	37	97	
6:00	33	58	82	92	265	
7:00	132	156	182	174	644	
8:00	249	250	328	256	1083	
9:00	210	229	210	200	849	
10:00	145	118	109	123	495	
11:00	94	112	118	97	421	
12:00	94	96	98	98	386	
13:00	82	116	108	93	399	
14:00	91	103	85	96	375	
15:00	140	107	97	83	427	
16:00	86	86	91	96	359	
17:00	86	97	82	88	353	
18:00	100	92	90	105	387	
19:00	80	86	94	65	325	
20:00	40	61	55	58	214	
21:00	57	55	36	28	176	
22:00	34	33	26	13	106	
23:00	15	8	5	10	38	
				TOTAL	7485	
AM PEAK HOUR		0800-0900				
VOLUME		1083				
PM PEAK HOUR		1445-1545				
VOLUME		440				

TOTAL BI-DIRECTIONAL VOLUME	15753
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# WILTEC

Phone: (626) 564-1944

Fax: (626) 564-0969

## 24-HOUR ADT COUNT SUMMARY

CLIENT: DKS ASSOCIATES  
 PROJECT: RT 262/MISSION BOULEVARD COUNTS  
 LOCATION: MISSION BLVD BETWEEN I-680 NB RAMPS  
 AND CURTNER ROAD  
 DATE: TUESDAY, JUNE 3, 2008

DIRECTION:		EB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	15	15	9	11	50	
1:00	8	3	5	2	18	
2:00	5	8	7	3	23	
3:00	0	4	1	5	10	
4:00	2	1	4	3	10	
5:00	4	3	8	13	28	
6:00	20	35	26	32	113	
7:00	36	34	64	96	230	
8:00	90	81	82	93	346	
9:00	62	62	54	60	238	
10:00	64	67	65	62	258	
11:00	84	74	96	90	344	
12:00	108	89	78	86	361	
13:00	92	82	96	86	356	
14:00	90	119	132	124	465	
15:00	160	131	182	230	703	
16:00	234	196	290	216	936	
17:00	232	288	266	274	1060	
18:00	296	288	255	251	1090	
19:00	244	202	180	206	832	
20:00	158	122	134	123	537	
21:00	120	88	85	83	376	
22:00	84	80	60	40	264	
23:00	44	36	34	15	129	
				TOTAL	8777	
AM PEAK HOUR		0745-0845				
VOLUME		349				
PM PEAK HOUR		1715-1815				
VOLUME		1124				

DIRECTION:		WB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	5	5	5	4	19	
1:00	1	5	1	2	9	
2:00	2	3	1	4	10	
3:00	3	7	4	1	15	
4:00	0	4	6	10	20	
5:00	11	20	30	38	99	
6:00	45	49	72	82	248	
7:00	138	166	198	188	690	
8:00	228	256	275	283	1042	
9:00	208	212	226	187	833	
10:00	156	140	132	106	534	
11:00	100	90	114	90	394	
12:00	82	94	113	102	391	
13:00	103	86	86	82	357	
14:00	78	72	100	92	342	
15:00	130	112	96	85	423	
16:00	104	108	76	100	388	
17:00	86	101	103	94	384	
18:00	97	112	91	72	372	
19:00	80	77	88	80	325	
20:00	64	68	60	48	240	
21:00	39	40	38	33	150	
22:00	28	29	21	23	101	
23:00	8	20	17	7	52	
				TOTAL	7438	
AM PEAK HOUR		0800-0900				
VOLUME		1042				
PM PEAK HOUR		1430-1530				
VOLUME		434				

TOTAL BI-DIRECTIONAL VOLUME	16215
-----------------------------	-------

# WILTEC

Phone: (626) 564-1944

Fax: (626) 564-0969

## 24-HOUR ADT COUNT SUMMARY

CLIENT: DKS ASSOCIATES  
 PROJECT: RT 262/MISSION BOULEVARD COUNTS  
 LOCATION: MISSION BLVD BETWEEN I-680 NB RAMPS  
 AND CURTNER ROAD  
 DATE: WEDNESDAY, JUNE 4, 2008

DIRECTION:		EB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	17	12	13	11	53	
1:00	4	2	9	1	16	
2:00	6	3	4	5	18	
3:00	1	3	3	6	13	
4:00	2	3	4	3	12	
5:00	4	2	8	13	27	
6:00	20	25	32	36	113	
7:00	50	42	58	102	252	
8:00	77	72	65	82	296	
9:00	67	48	70	55	240	
10:00	82	70	56	66	274	
11:00	86	79	84	103	352	
12:00	122	110	97	106	435	
13:00	94	102	94	102	392	
14:00	108	108	134	122	472	
15:00	156	146	180	147	629	
16:00	172	192	191	202	757	
17:00	252	328	358	310	1248	
18:00	332	307	260	250	1149	
19:00	247	220	214	203	884	
20:00	166	142	130	122	560	
21:00	116	112	109	70	407	
22:00	88	90	47	56	281	
23:00	49	36	32	18	135	
				TOTAL	9015	
AM PEAK HOUR		1100-1200				
VOLUME		352				
PM PEAK HOUR		1715-1815				
VOLUME		1328				

DIRECTION:		WB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	7	10	5	8	30	
1:00	3	3	0	0	6	
2:00	6	0	2	5	13	
3:00	2	1	4	2	9	
4:00	4	7	7	9	27	
5:00	12	21	25	35	93	
6:00	45	47	74	88	254	
7:00	144	141	194	175	654	
8:00	222	272	260	238	992	
9:00	240	244	202	206	892	
10:00	168	107	96	111	482	
11:00	95	100	106	108	409	
12:00	95	87	100	99	381	
13:00	102	97	110	82	391	
14:00	104	79	94	110	387	
15:00	110	113	98	114	435	
16:00	96	98	89	98	381	
17:00	104	103	80	90	377	
18:00	103	100	101	82	386	
19:00	98	96	86	71	351	
20:00	79	65	63	82	289	
21:00	54	44	40	32	170	
22:00	43	44	19	17	123	
23:00	23	16	15	19	73	
				TOTAL	7605	
AM PEAK HOUR		0815-0915				
VOLUME		1010				
PM PEAK HOUR		1500-1600				
VOLUME		435				

TOTAL BI-DIRECTIONAL VOLUME	16620
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# WILTEC

Phone: (626) 564-1944

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## 24-HOUR ADT COUNT SUMMARY

CLIENT: DKS ASSOCIATES  
 PROJECT: RT 262/MISSION BOULEVARD COUNTS  
 LOCATION: MISSION BLVD BETWEEN I-680 NB RAMPS  
 AND CURTNER ROAD  
 DATE: THURSDAY, MAY 29, 2008

DIRECTION:		EB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	19	17	12	12	60	
1:00	10	8	7	4	29	
2:00	10	5	6	3	24	
3:00	4	5	2	6	17	
4:00	2	2	5	3	12	
5:00	2	6	11	20	39	
6:00	17	25	33	32	107	
7:00	46	48	59	101	254	
8:00	71	86	84	88	329	
9:00	62	63	70	68	263	
10:00	68	72	50	70	260	
11:00	90	86	90	107	373	
12:00	112	94	85	84	375	
13:00	90	94	94	100	378	
14:00	108	128	131	127	494	
15:00	156	168	284	340	948	
16:00	354	336	354	420	1464	
17:00	390	367	320	332	1409	
18:00	298	256	291	260	1105	
19:00	270	216	185	186	857	
20:00	172	129	113	115	529	
21:00	136	88	106	76	406	
22:00	66	67	47	44	224	
23:00	69	31	28	23	151	
				TOTAL	10107	
AM PEAK HOUR		1100-1200				
VOLUME		373				
PM PEAK HOUR		1630-1730				
VOLUME		1531				

DIRECTION:		WB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	16	7	2	4	29	
1:00	8	10	5	1	24	
2:00	4	6	3	4	17	
3:00	3	3	1	2	9	
4:00	1	4	11	11	27	
5:00	14	22	22	40	98	
6:00	44	64	77	100	285	
7:00	120	151	194	194	659	
8:00	220	254	288	226	988	
9:00	232	222	207	195	856	
10:00	164	136	125	106	531	
11:00	98	106	100	140	444	
12:00	105	101	97	101	404	
13:00	90	84	83	84	341	
14:00	104	84	104	121	413	
15:00	129	105	112	79	425	
16:00	86	81	102	98	367	
17:00	115	84	86	80	365	
18:00	120	97	87	90	394	
19:00	91	111	84	71	357	
20:00	58	66	46	57	227	
21:00	43	51	37	54	185	
22:00	41	25	32	19	117	
23:00	21	16	10	9	56	
				TOTAL	7618	
AM PEAK HOUR		0815-0915				
VOLUME		1000				
PM PEAK HOUR		1445-1545				
VOLUME		467				

TOTAL BI-DIRECTIONAL VOLUME	17725
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# WILTEC

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## 24-HOUR ADT COUNT SUMMARY

CLIENT: DKS ASSOCIATES  
 PROJECT: RT 262/MISSION BOULEVARD COUNTS  
 LOCATION: MISSION BLVD BETWEEN I-680 NB RAMPS  
 AND CURTNER ROAD  
 DATE: FRIDAY, MAY 30, 2008

DIRECTION:		EB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	17	13	22	11	63	
1:00	10	12	6	9	37	
2:00	6	8	7	10	31	
3:00	6	4	0	3	13	
4:00	4	3	2	7	16	
5:00	5	10	8	19	42	
6:00	13	24	28	38	103	
7:00	43	42	61	88	234	
8:00	78	85	80	74	317	
9:00	56	60	57	58	231	
10:00	60	66	74	74	274	
11:00	62	94	88	84	328	
12:00	114	94	116	120	444	
13:00	96	100	103	102	401	
14:00	132	124	164	188	608	
15:00	304	340	339	384	1367	
16:00	362	380	376	382	1500	
17:00	396	383	260	275	1314	
18:00	286	276	234	256	1052	
19:00	242	218	169	163	792	
20:00	159	138	148	120	565	
21:00	126	124	96	100	446	
22:00	94	90	98	76	358	
23:00	62	82	52	53	249	
				TOTAL	10785	
AM PEAK HOUR		0745-0845				
VOLUME		331				
PM PEAK HOUR		1630-1730				
VOLUME		1537				

DIRECTION:		WB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	7	8	4	7	26	
1:00	4	4	4	2	14	
2:00	1	2	0	7	10	
3:00	2	3	0	4	9	
4:00	3	6	8	14	31	
5:00	14	18	29	42	103	
6:00	41	47	77	79	244	
7:00	113	133	162	188	596	
8:00	224	228	249	240	941	
9:00	211	202	167	164	744	
10:00	178	142	95	116	531	
11:00	89	133	112	122	456	
12:00	104	101	113	90	408	
13:00	101	121	100	89	411	
14:00	76	104	94	119	393	
15:00	120	119	130	104	473	
16:00	89	100	94	96	379	
17:00	106	101	97	134	438	
18:00	126	144	107	136	513	
19:00	134	125	100	107	466	
20:00	92	80	64	77	313	
21:00	80	65	52	43	240	
22:00	46	41	40	32	159	
23:00	26	32	19	34	111	
				TOTAL	8009	
AM PEAK HOUR		0800-0900				
VOLUME		941				
PM PEAK HOUR		1815-1915				
VOLUME		521				

TOTAL BI-DIRECTIONAL VOLUME	18794
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# WILTEC

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## 24-HOUR ADT COUNT SUMMARY

CLIENT: DKS ASSOCIATES  
 PROJECT: RT 262/MISSION BOULEVARD COUNTS  
 LOCATION: MISSION BLVD BETWEEN I-680 NB RAMPS  
 AND CURTNER ROAD  
 DATE: SATURDAY, MAY 31, 2008

DIRECTION:		EB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	36	22	35	24	117	
1:00	12	29	14	17	72	
2:00	15	16	9	7	47	
3:00	4	6	5	2	17	
4:00	1	4	2	5	12	
5:00	9	11	17	21	58	
6:00	21	32	26	27	106	
7:00	35	31	39	46	151	
8:00	58	60	60	94	272	
9:00	74	83	90	108	355	
10:00	92	98	88	129	407	
11:00	138	118	143	155	554	
12:00	150	150	148	128	576	
13:00	158	130	148	140	576	
14:00	142	150	154	152	598	
15:00	150	127	160	162	599	
16:00	154	148	146	125	573	
17:00	171	150	149	138	608	
18:00	149	126	131	116	522	
19:00	106	110	140	110	466	
20:00	101	126	120	108	455	
21:00	92	92	96	91	371	
22:00	106	94	78	74	352	
23:00	67	72	65	48	252	
				TOTAL	8116	
AM PEAK HOUR		1100-1200				
VOLUME		554				
PM PEAK HOUR		1530-1630				
VOLUME		624				

DIRECTION:		WB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	18	15	13	10	56	
1:00	9	9	6	6	30	
2:00	17	3	5	3	28	
3:00	4	3	1	2	10	
4:00	0	8	3	5	16	
5:00	3	7	15	17	42	
6:00	8	18	26	31	83	
7:00	34	44	61	48	187	
8:00	64	90	108	131	393	
9:00	114	135	128	152	529	
10:00	151	138	146	131	566	
11:00	171	136	122	168	597	
12:00	134	174	151	134	593	
13:00	139	142	143	138	562	
14:00	135	131	151	141	558	
15:00	144	131	116	139	530	
16:00	132	106	114	120	472	
17:00	107	144	150	130	531	
18:00	98	114	154	123	489	
19:00	126	136	118	82	462	
20:00	91	74	78	90	333	
21:00	64	63	52	58	237	
22:00	52	46	32	44	174	
23:00	38	40	40	38	156	
				TOTAL	7634	
AM PEAK HOUR		1100-1200				
VOLUME		597				
PM PEAK HOUR		1215-1315				
VOLUME		598				

TOTAL BI-DIRECTIONAL VOLUME	15750
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# WILTEC

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## 24-HOUR ADT COUNT SUMMARY

CLIENT: DKS ASSOCIATES  
 PROJECT: RT 262/MISSION BOULEVARD COUNTS  
 LOCATION: MISSION BLVD BETWEEN I-680 NB RAMPS  
 AND CURTNER ROAD  
 DATE: SUNDAY, JUNE 1, 2008

DIRECTION:		EB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	43	42	44	28	157	
1:00	24	22	24	28	98	
2:00	12	13	16	13	54	
3:00	7	11	6	14	38	
4:00	7	8	4	6	25	
5:00	6	10	18	23	57	
6:00	16	14	24	38	92	
7:00	35	48	60	39	182	
8:00	56	53	74	72	255	
9:00	52	78	75	73	278	
10:00	117	98	112	128	455	
11:00	120	116	130	132	498	
12:00	127	157	129	168	581	
13:00	165	148	157	130	600	
14:00	146	132	136	146	560	
15:00	126	150	135	138	549	
16:00	133	144	134	138	549	
17:00	154	140	103	154	551	
18:00	128	124	122	108	482	
19:00	118	110	102	116	446	
20:00	113	87	100	86	386	
21:00	89	87	68	62	306	
22:00	79	62	46	52	239	
23:00	40	44	24	26	134	
				TOTAL	7572	
AM PEAK HOUR		1100-1200				
VOLUME		498				
PM PEAK HOUR		1245-1345				
VOLUME		638				

DIRECTION:		WB				HOUR TOTALS
TIME	00-15	15-30	30-45	45-60		
0:00	34	22	30	28	114	
1:00	17	17	14	23	71	
2:00	9	15	6	5	35	
3:00	8	7	4	2	21	
4:00	5	9	5	6	25	
5:00	4	4	8	7	23	
6:00	14	9	14	23	60	
7:00	22	30	34	35	121	
8:00	55	60	92	114	321	
9:00	92	104	104	146	446	
10:00	143	128	122	146	539	
11:00	116	144	126	135	521	
12:00	152	175	170	131	628	
13:00	176	144	116	147	583	
14:00	142	131	140	120	533	
15:00	150	150	121	160	581	
16:00	142	134	142	119	537	
17:00	136	106	113	110	465	
18:00	106	110	116	74	406	
19:00	86	94	92	83	355	
20:00	84	73	72	72	301	
21:00	56	58	42	34	190	
22:00	40	22	28	31	121	
23:00	17	22	15	12	66	
				TOTAL	7063	
AM PEAK HOUR		0945-1045				
VOLUME		539				
PM PEAK HOUR		1215-1315				
VOLUME		652				

TOTAL BI-DIRECTIONAL VOLUME	14635
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