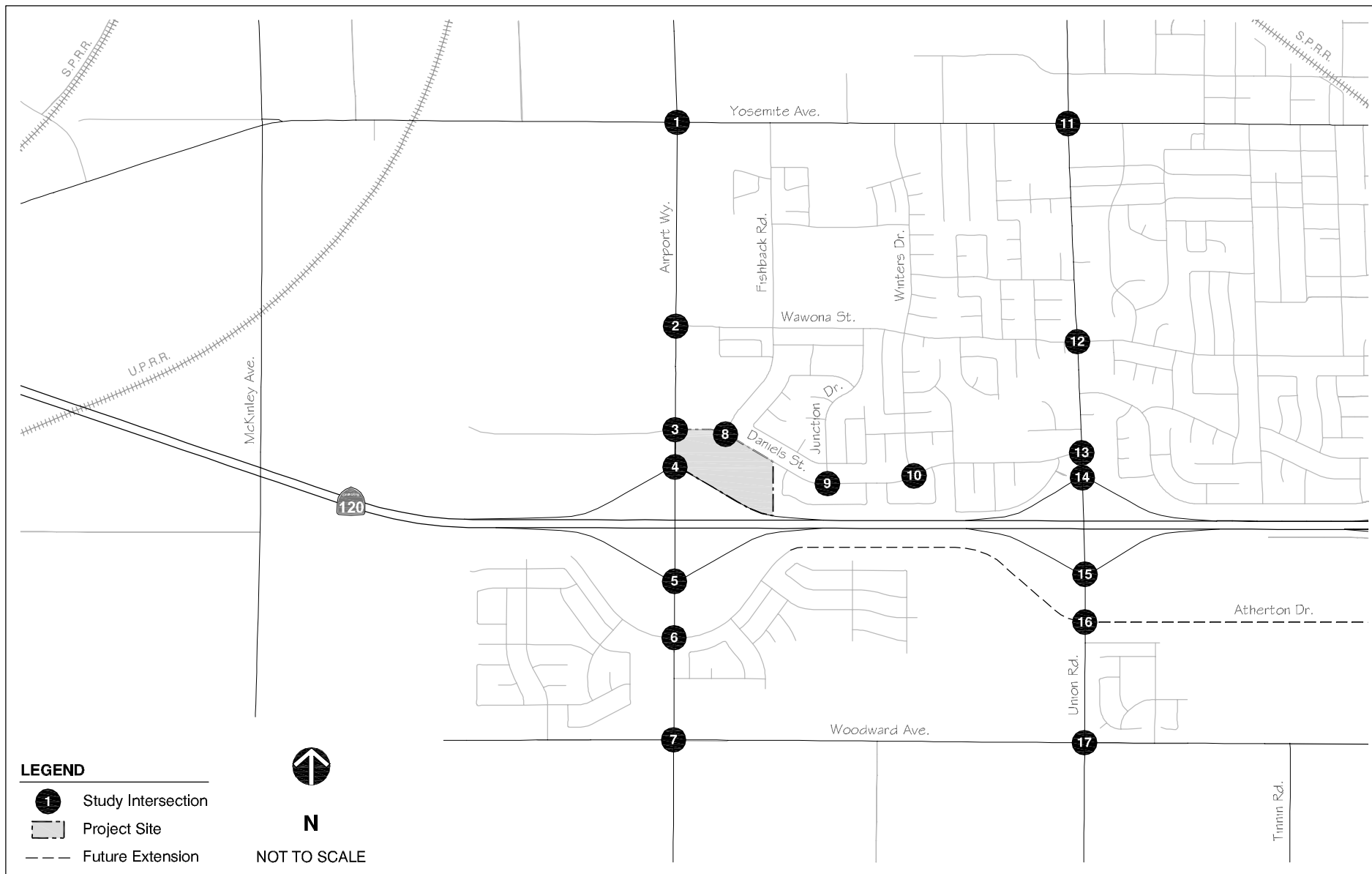
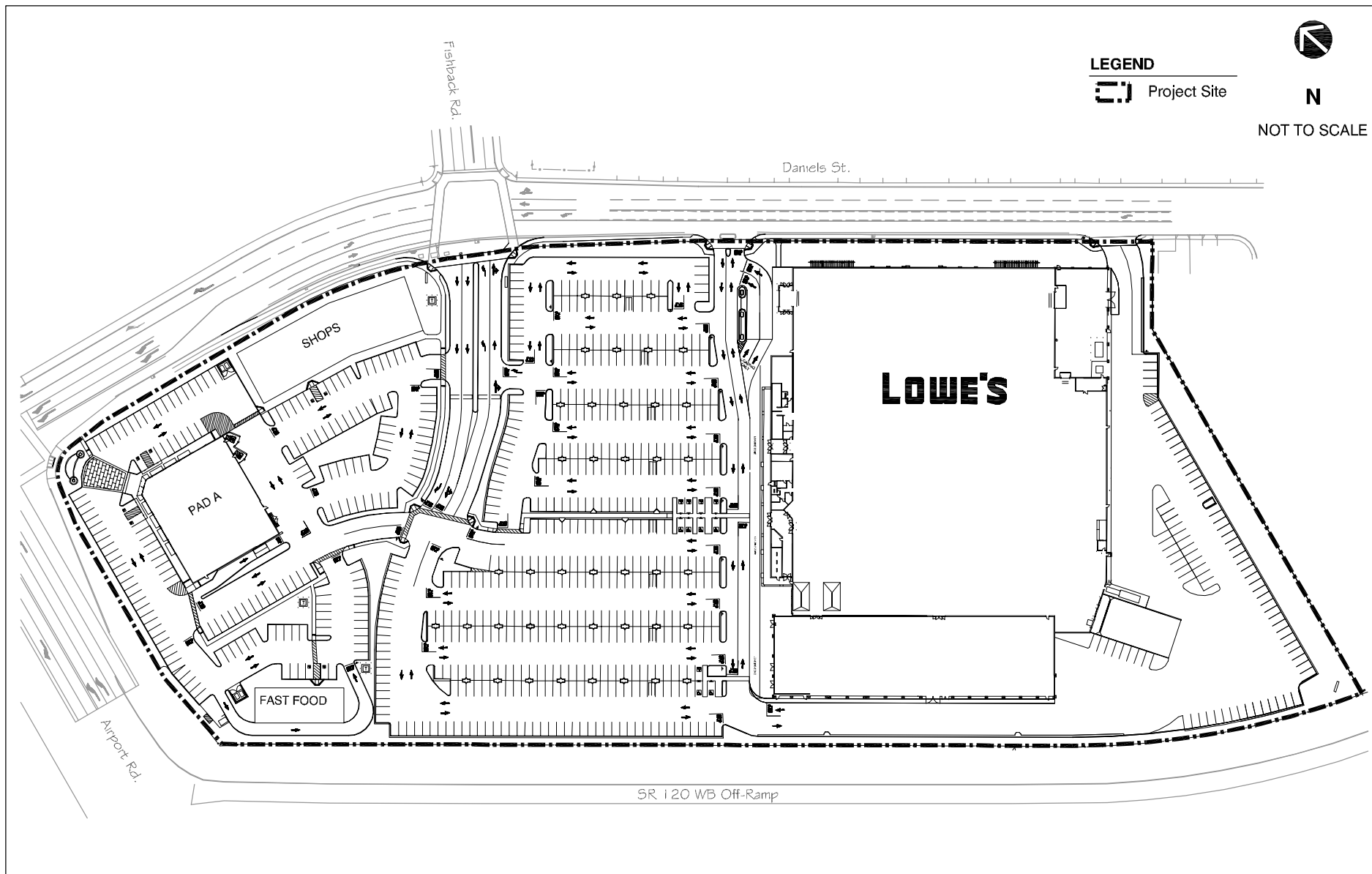
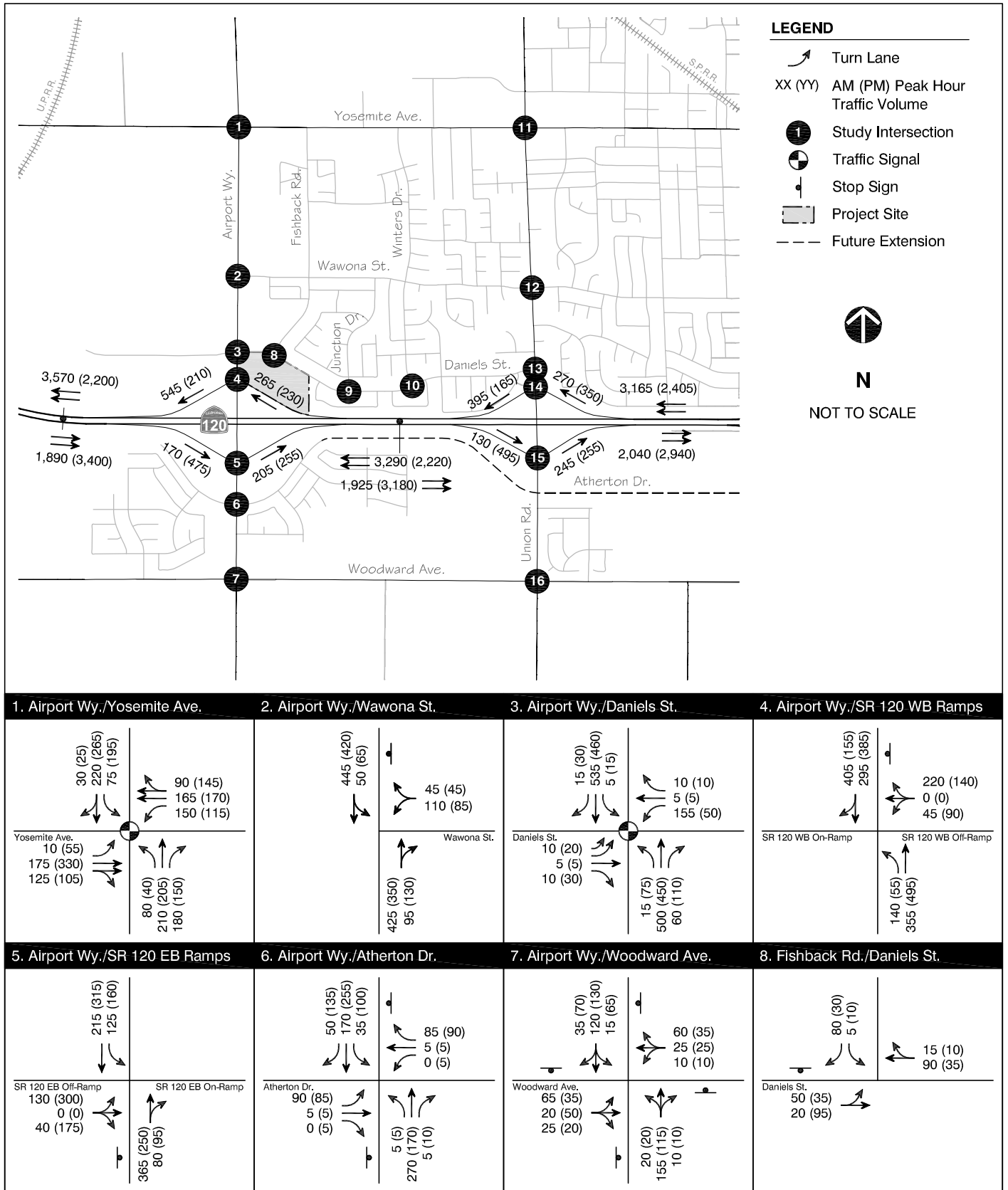


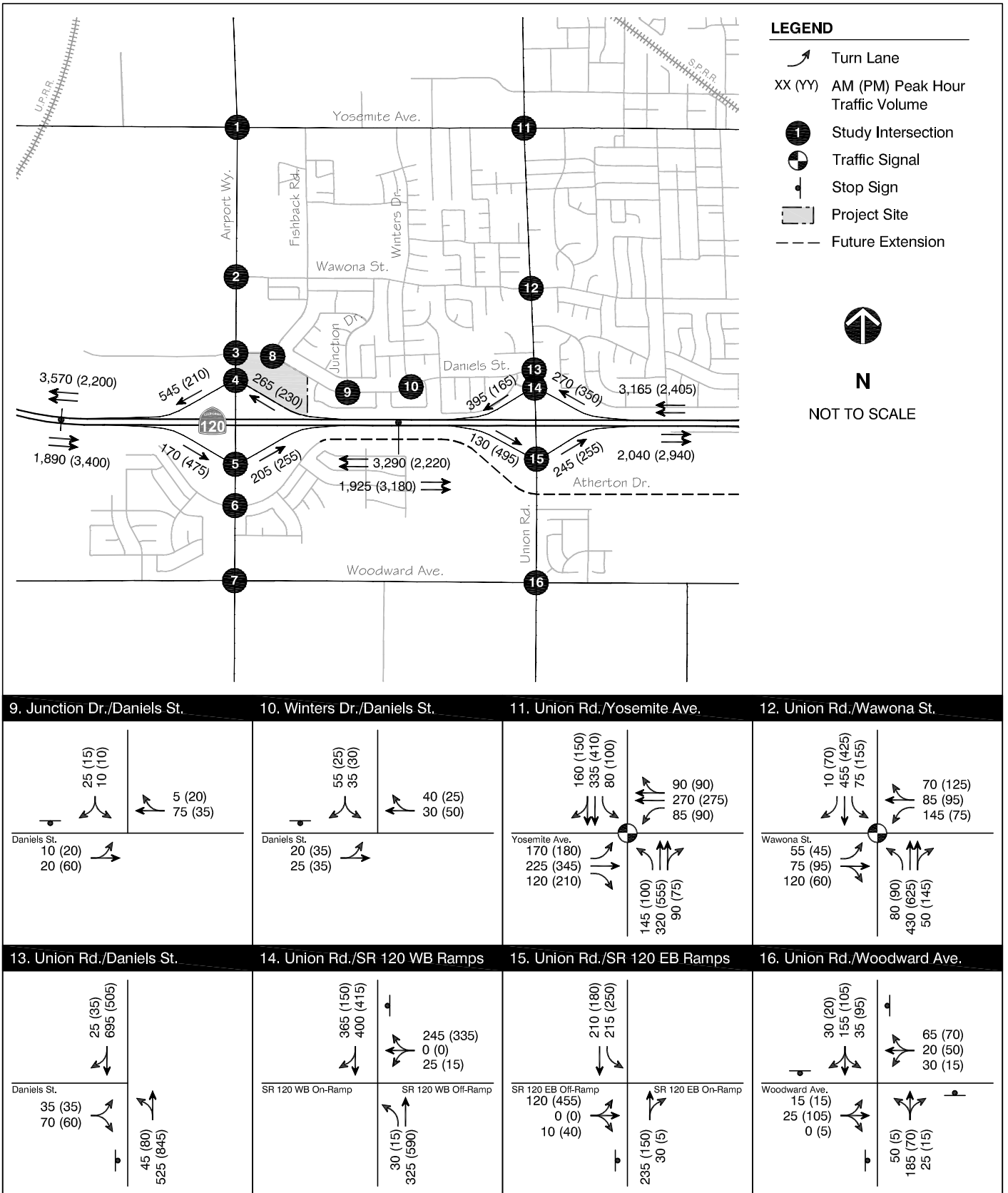
APPENDIX E

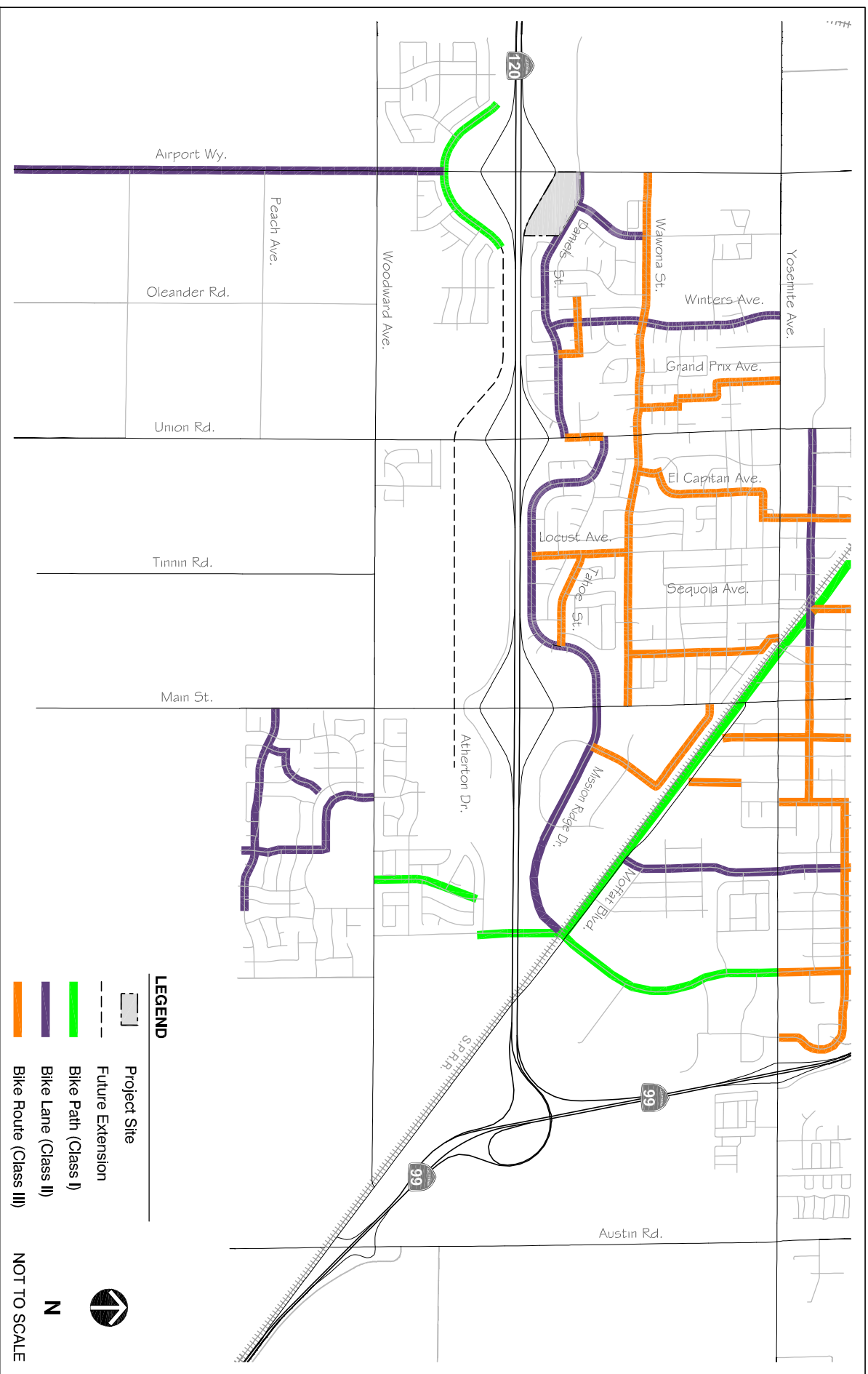
Transportation and Circulation Technical Appendix









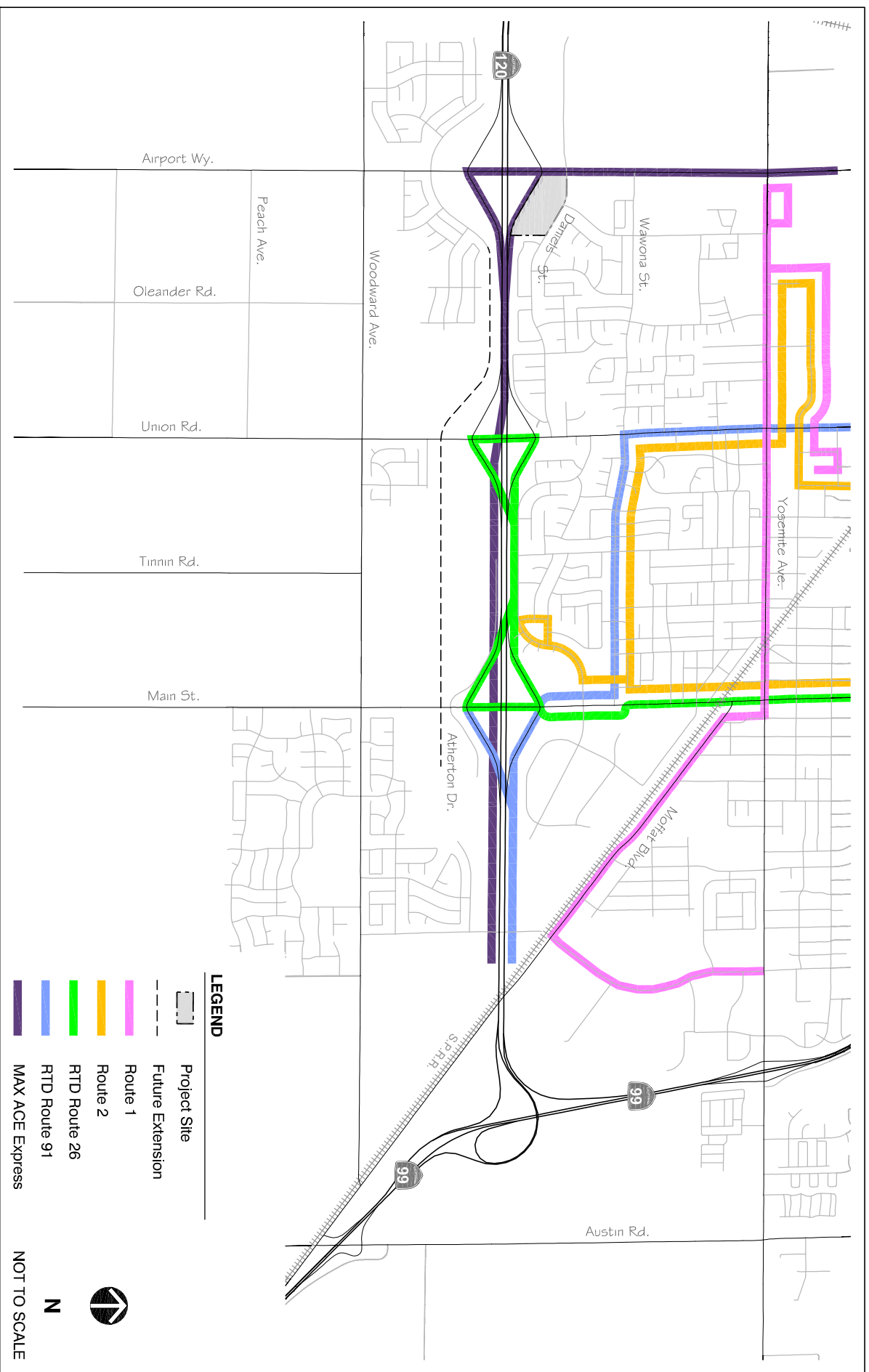


FEHR & PEERS
TRANSPORTATION CONSULTANTS

Aug 16, 2007 MJC
N:\2007Projects\2399_Stadium_Center_Phase_III_EIR\Graphics\draft\Fig11-4_ex_bikes.dwg

EXISTING BICYCLE FACILITIES

FIGURE 11-4

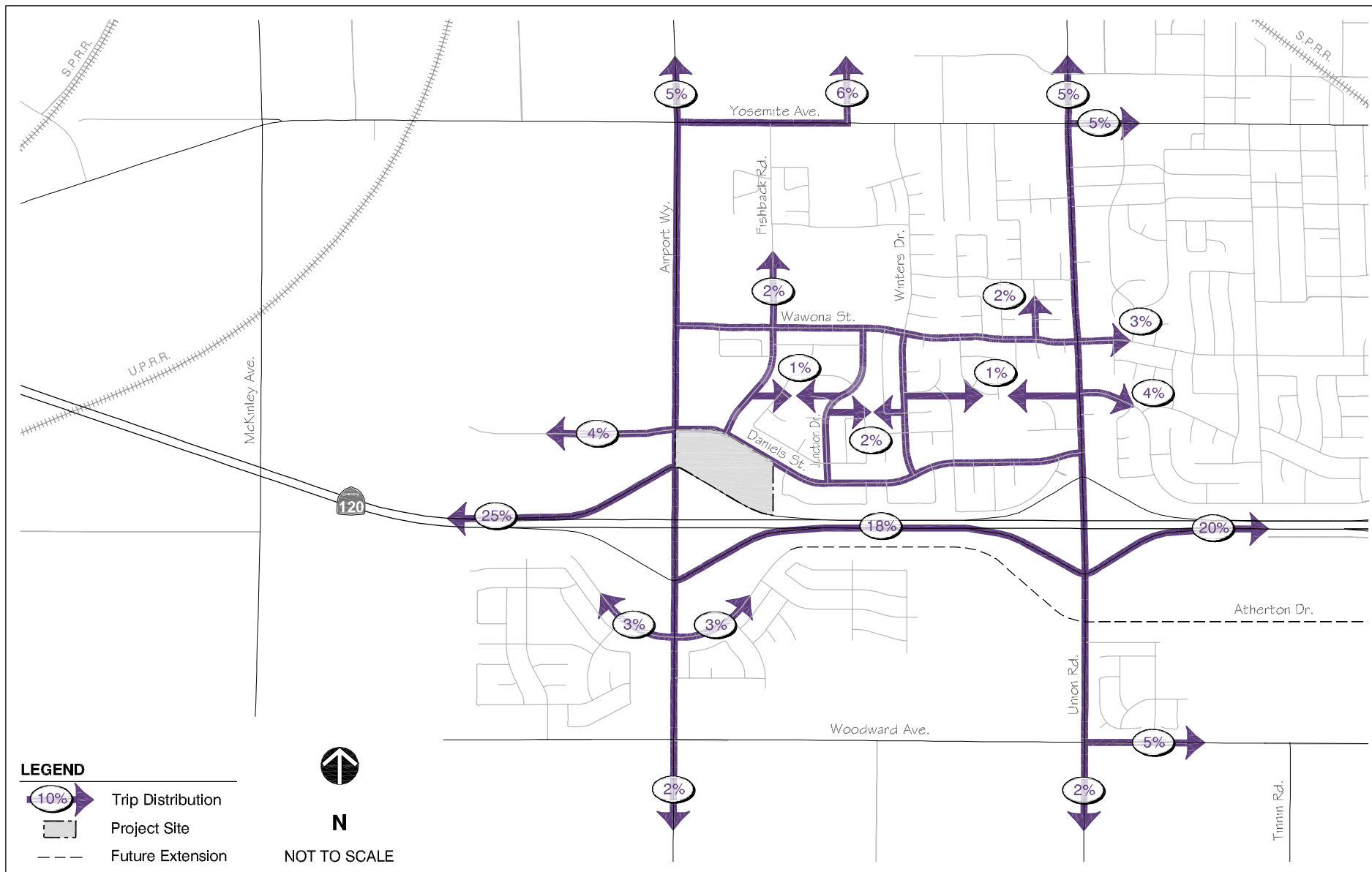


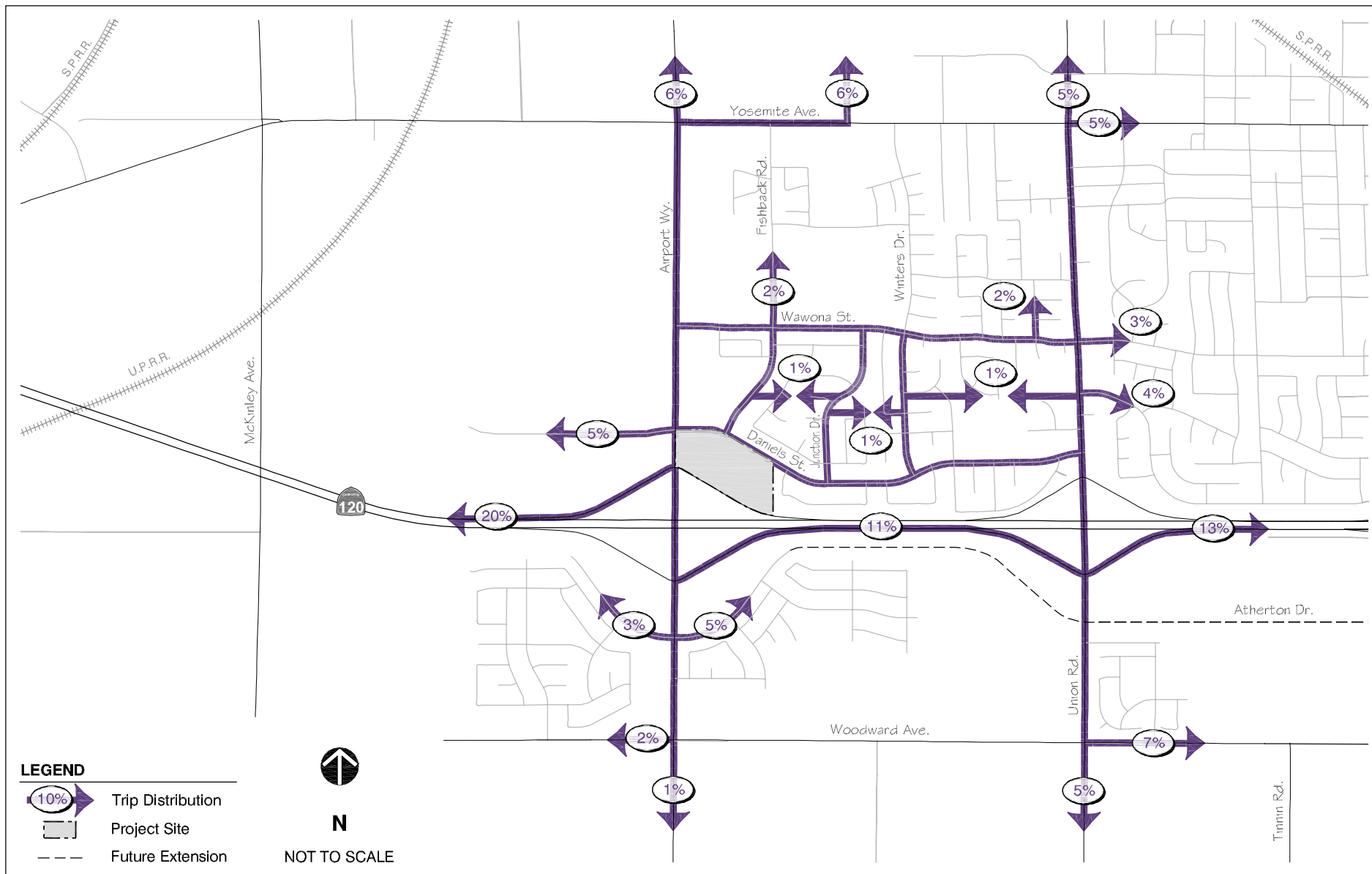
FEHR & PEERS
TRANSPORTATION CONSULTANTS

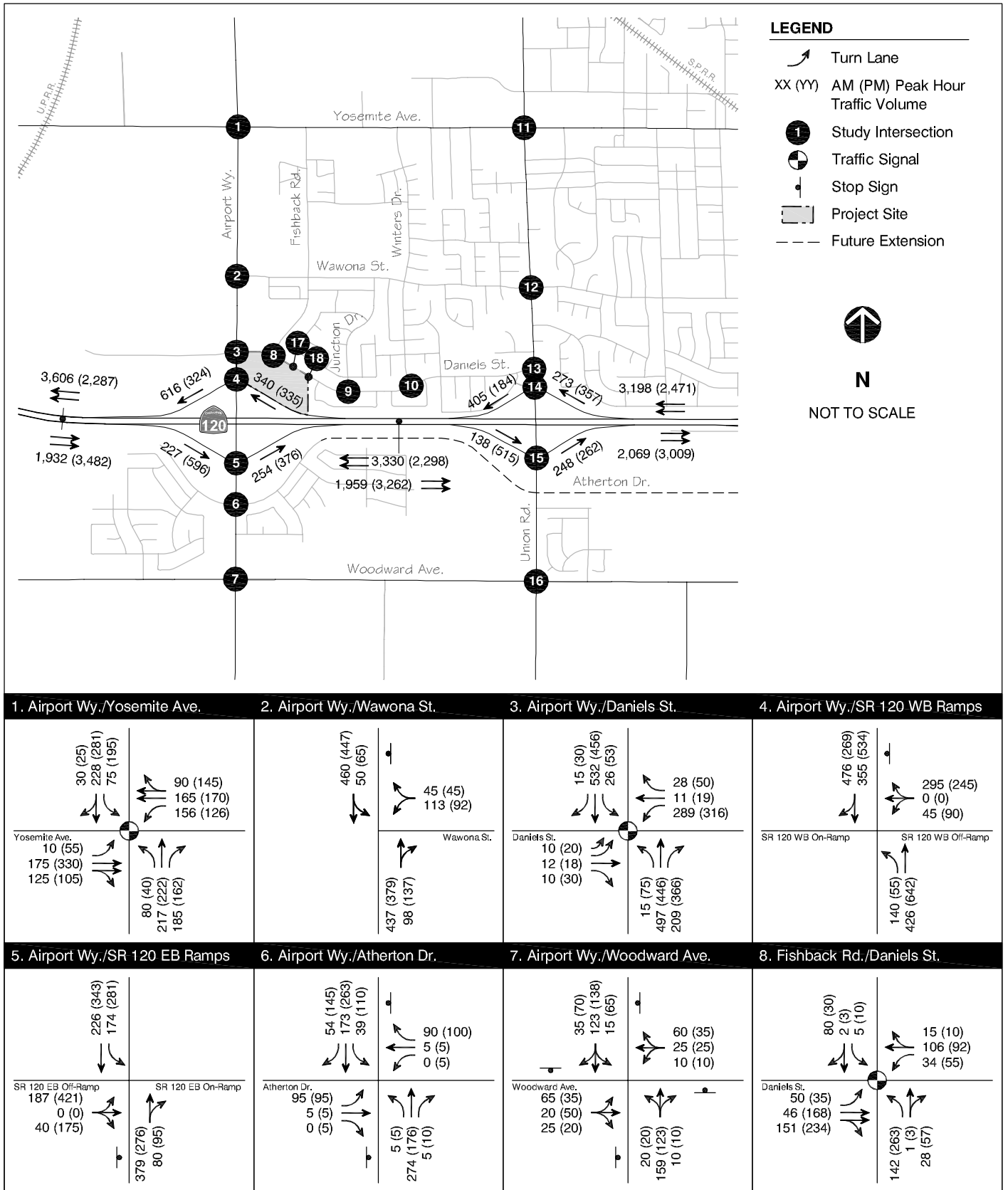
Aug 16, 2007 MJC
N:\2007Projects\2399_Stadium_Center_Phase_III_EIR\Graphics\draft\fig11-5_ex_transit.dwg

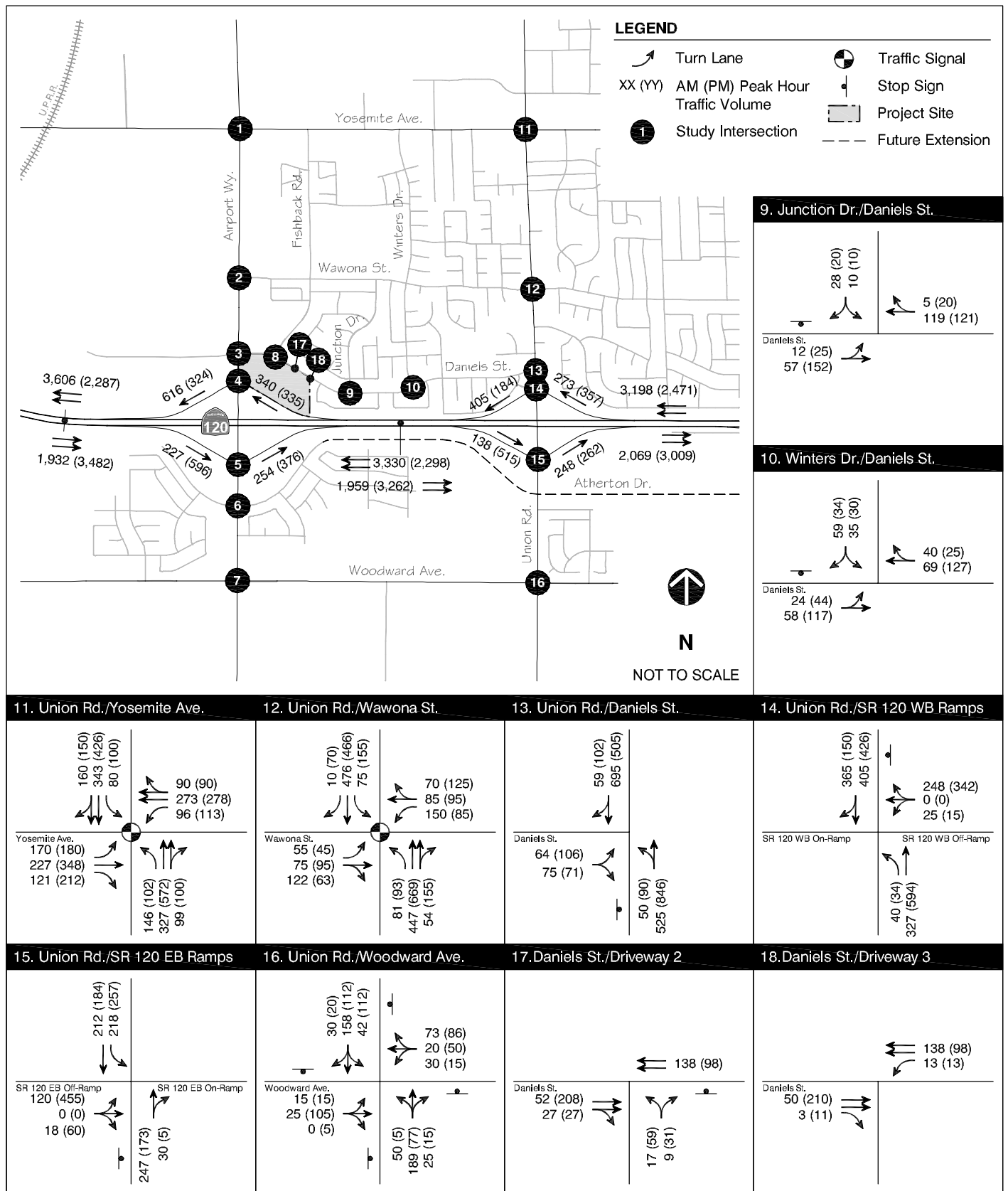
EXISTING TRANSIT SERVICE

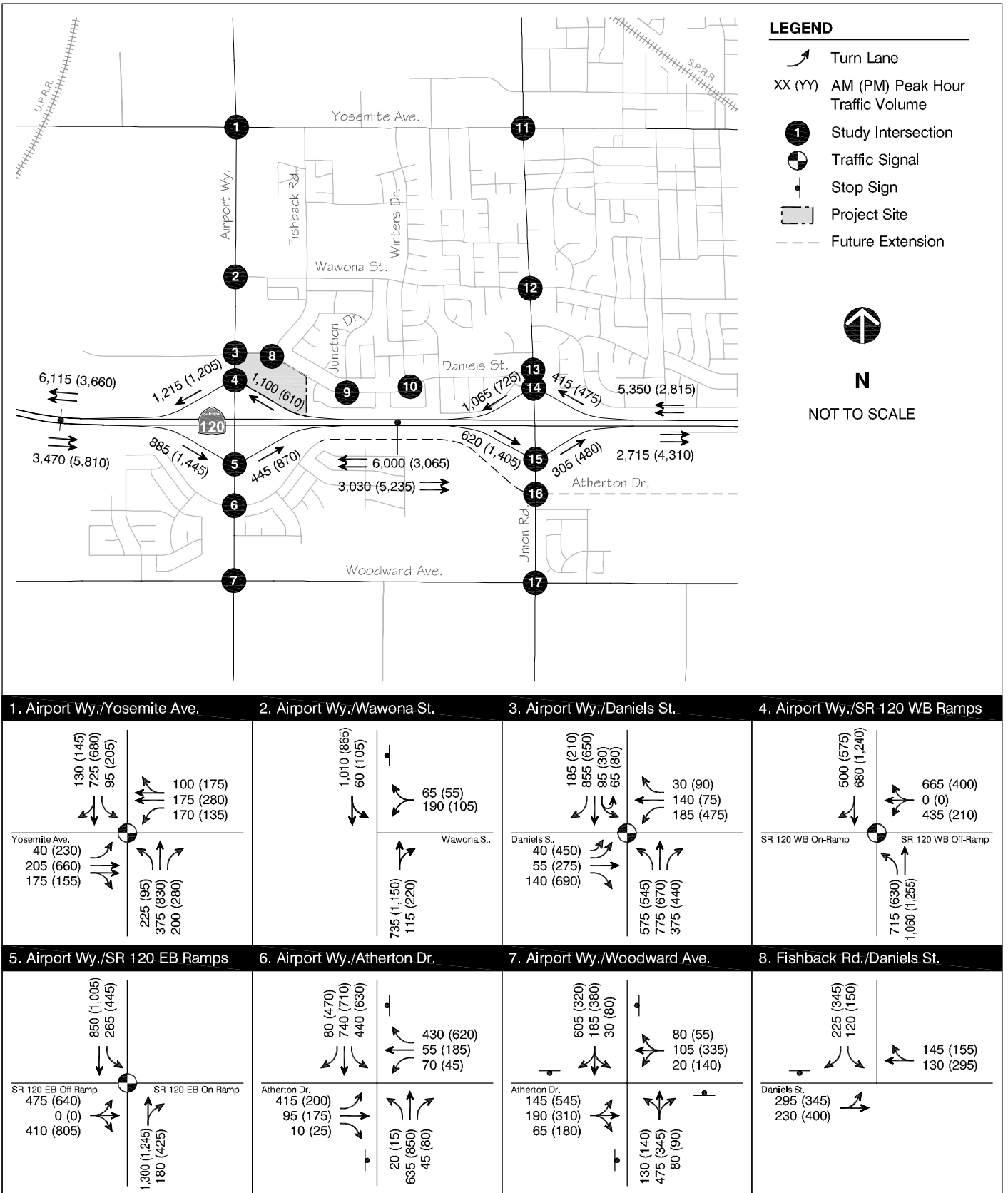
FIGURE 11-5

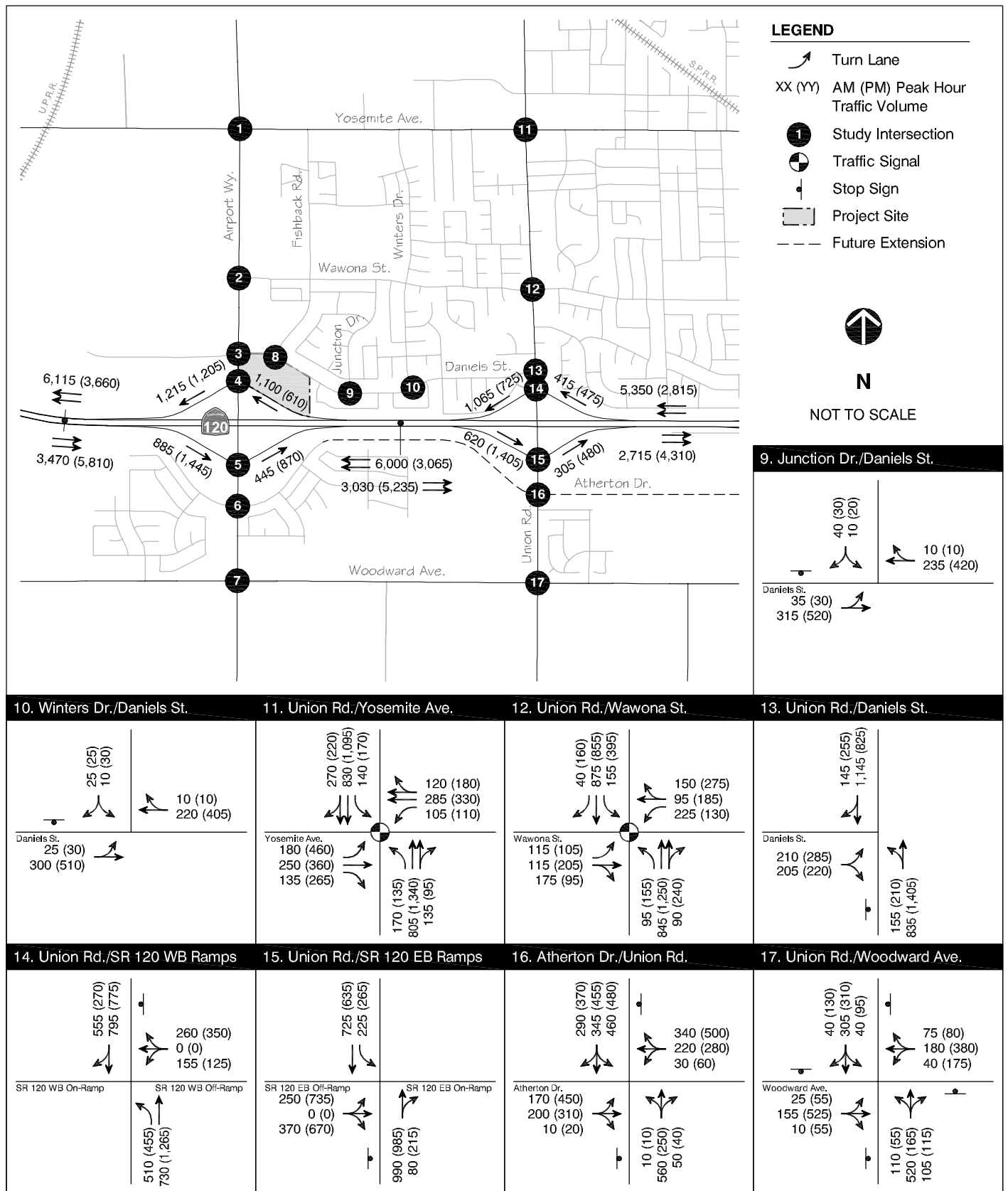


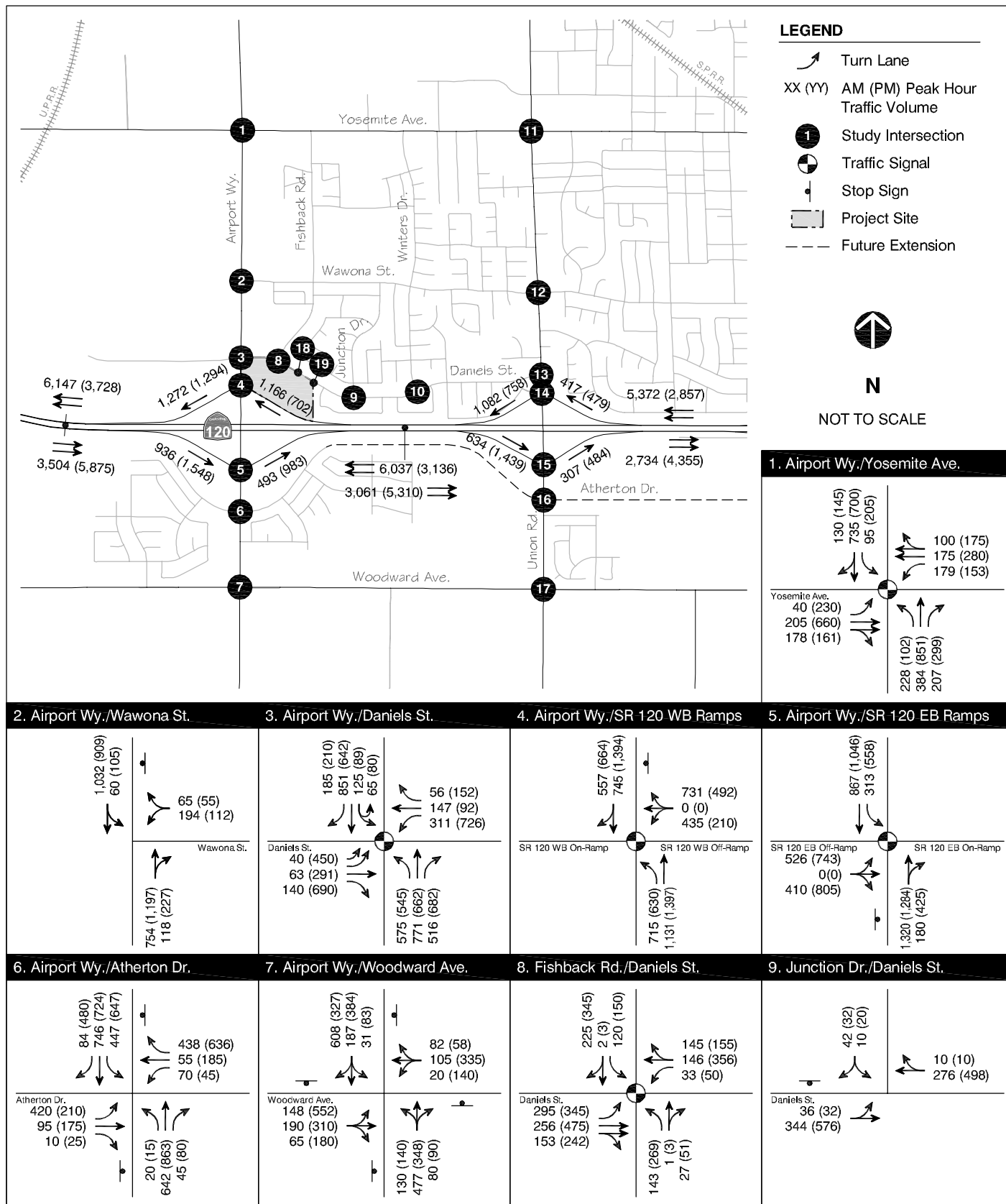


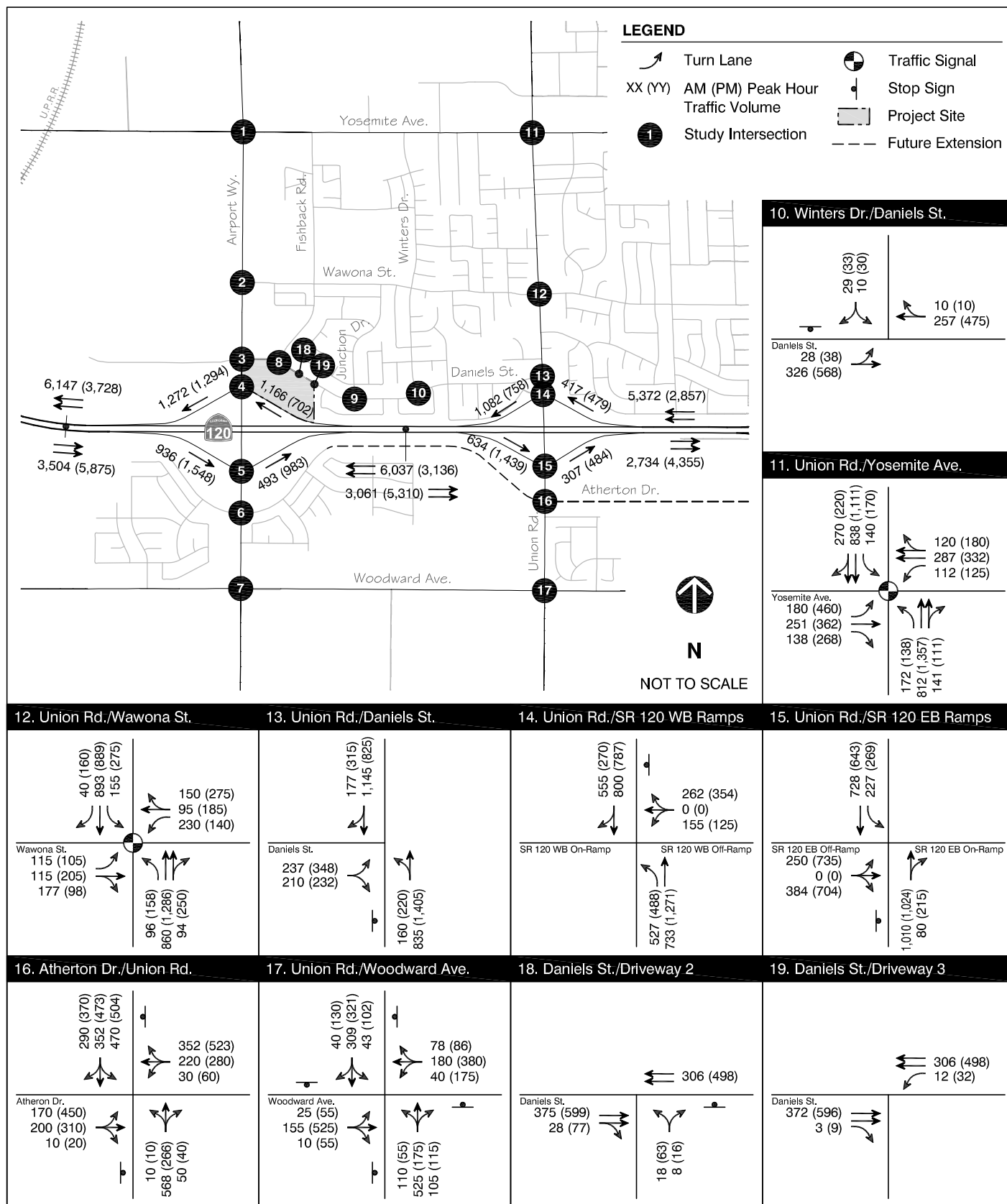


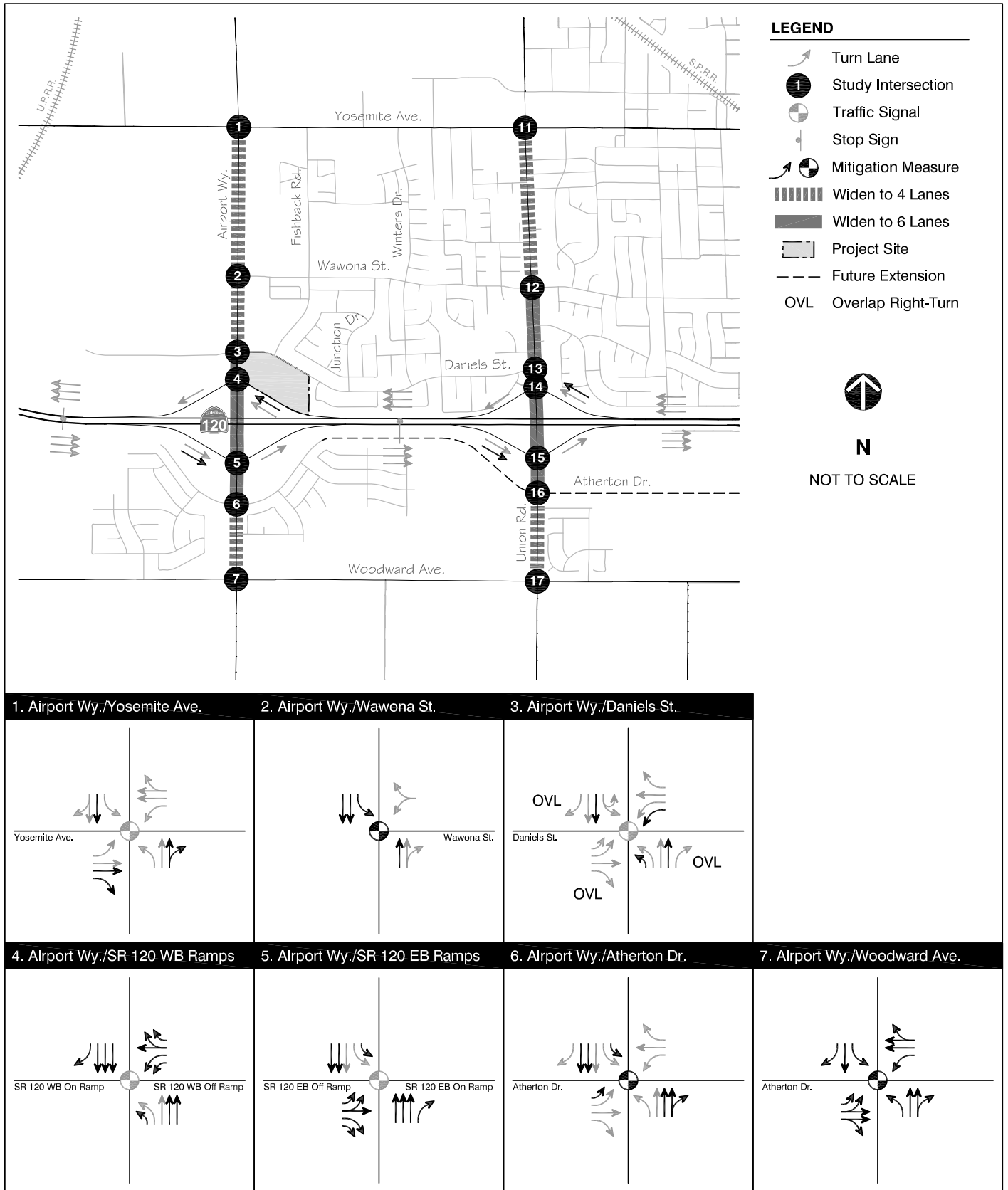


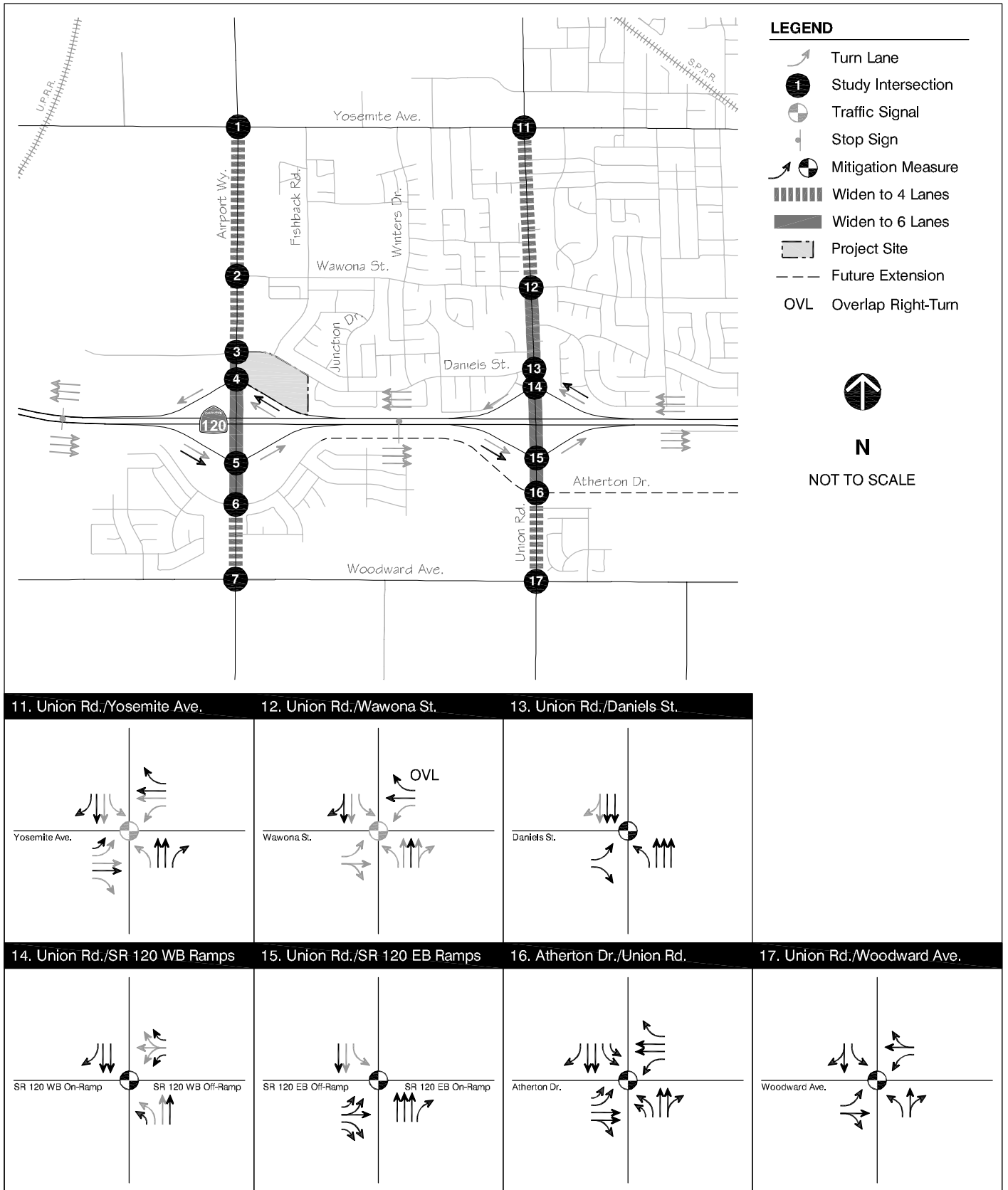












Manteca
1: Yosemite Avenue & Airport Way

Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.94	1.00	0.95	1.00	0.95	1.00	1.00	0.85	1.00	0.98	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3318	1770	3351	1770	3351	1770	1863	1583	1770	1829	1829
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3318	1770	3351	1770	3351	1770	1863	1583	1770	1829	1829
Volume (vph)	10	175	125	150	165	90	80	210	180	75	220	30
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)	11	190	136	163	179	98	87	228	196	82	239	33
RTOR Reduction (vph)	0	113	0	0	72	0	0	0	118	0	6	0
Lane Group Flow (vph)	11	213	0	163	205	0	87	228	78	82	266	0
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Perm	Prot	Prot	Prot	Prot
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	1.2	12.3		7.9	19.0		5.8	28.8	28.8	7.0	30.0	
Effective Green, g (s)	1.2	12.3		7.9	19.0		5.8	28.8	28.8	7.0	30.0	
Actuated g/C Ratio	0.02	0.17		0.11	0.26		0.08	0.40	0.40	0.10	0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	30	567		194	884		143	745	633	172	762	
v/s Ratio Prot	0.01	0.06		0.09	0.06		0.05	0.12	0.05	0.05	0.15	
v/s Ratio Perm									0.05			
v/c Ratio	0.37	0.38		0.84	0.23		0.61	0.31	0.12	0.48	0.35	
Uniform Delay, d1	35.0	26.4		31.4	20.8		32.0	14.8	13.6	30.8	14.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.4	0.4		26.5	0.1		7.1	1.1	0.4	2.1	1.3	
Delay (s)	42.5	26.9		57.9	20.9		39.1	15.8	14.0	32.8	15.6	
Level of Service	D	C		E	C		D	B	B	C	B	
Approach Delay (s)	27.4			34.6			19.1			19.6		
Approach LOS	C			C			B			B		
Intersection Summary												
HCM Average Control Delay	25.1			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.42						12.0					
Actuated Cycle Length (s)	72.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	48.3%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
2: Wawona St. & Airport Way

Existing Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	110	45	425	95	50	445
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	49	462	103	54	484
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)			1313			
pX, platoon unblocked	0.78	0.78			0.78	
vC, conflicting volume	1106	514			565	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1135	379			445	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	27	91			94	
cM capacity (veh/h)	164	523			874	
Direction, Lane #						
Volume Total	168	565	538			
Volume Left	120	0	54			
Volume Right	49	103	0			
cSH	205	1700	874			
Volume to Capacity	0.82	0.33	0.06			
Queue Length 95th (ft)	150	0	5			
Control Delay (s)	72.4	0.0	1.7			
Lane LOS	F	A				
Approach Delay (s)	72.4	0.0	1.7			
Approach LOS	F					
Intersection Summary						
Average Delay	10.3					
Intersection Capacity Utilization	73.2%			ICU Level of Service		
Analysis Period (min)	15			D		

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
3: Daniels Street & Airport Way

Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	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	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	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	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	10	5	10	155	5	10	15	500	60	5	535	15
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)	11	5	11	168	5	11	16	543	65	5	582	16
RTOR Reduction (vph)	0	0	9	0	0	9	0	0	39	0	0	5
Lane Group Flow (vph)	11	5	2	168	5	2	16	543	26	5	582	11
Turn Type	Prot	Prot	Perm	Prot	Prot	Perm	Prot	Prot	Perm	Prot	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	6.1	7.8	7.8	6.5	8.2	8.2	0.9	20.1	20.1	0.7	19.9	19.9
Effective Green, g (s)	6.1	7.8	7.8	6.5	8.2	8.2	0.9	20.1	20.1	0.7	19.9	19.9
Actuated g/C Ratio	0.12	0.15	0.15	0.13	0.16	0.16	0.02	0.39	0.39	0.01	0.39	0.39
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	410	284	242	225	299	254	31	733	623	24	726	616
v/s Ratio Prot	0.00	c0.00		c0.09	0.00		c0.01	0.29		0.00	c0.31	
v/s Ratio Perm			0.00			0.00			0.02			0.01
v/c Ratio	0.03	0.02	0.01	0.75	0.02	0.01	0.52	0.74	0.04	0.21	0.80	0.02
Uniform Delay, d1	19.9	18.4	18.4	21.5	18.1	18.0	24.9	13.3	9.6	24.9	13.8	9.6
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	0.0	0.0	0.0	12.6	0.0	0.0	13.7	4.0	0.0	4.3	6.4	0.0
Delay (s)	19.9	18.4	18.4	34.2	18.1	18.0	38.6	17.3	9.6	29.2	20.2	9.6
Level of Service	B	B	B	C	B	B	D	B	A	C	C	A
Approach Delay (s)	19.0			32.8			17.1			20.0		
Approach LOS	B			C			B			C		
Intersection Summary												
HCM Average Control Delay	20.3			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.61						16.0					
Actuated Cycle Length (s)	51.1			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	50.1%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
4: SR 120 WB & Airport Way

Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	0	0	0	45	0	220	140	355	0	0	295	405
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	49	0	239	152	386	0	0	321	440
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)										494		
pX, platform unblocked v	0.70	0.70	0.70	0.70	0.70		0.70					
pC, conflicting volume	1470	1231	541	1231	1451	386	761			386		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCU, unblocked vol	1673	1330	343	1330	1645	386	658			386		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	6.1			4.1		
IC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	35	100	64	77			100		
cM capacity (veh/h)	28	83	489	75	53	662	650			1173		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1								
Volume Total	288	152	386	761								
Volume Left	49	152	0	0								
Volume Right	239	0	0	440								
cSH	285	650	1700	1700								
Volume to Capacity	1.01	0.23	0.23	0.45								
Queue Length 95th (ft)	264	23	0	0								
Control Delay (s)	95.7	12.2	0.0	0.0								
Lane LOS	F	B										
Approach Delay (s)	95.7	3.5		0.0								
Approach LOS	F											
Intersection Summary												
Average Delay	18.5											
Intersection Capacity Utilization	74.2%											
Analysis Period (min)	15											
	ICU Level of Service											
	D											

Manteca
5: SR 120 EB & Airport Way

Existing Conditions

AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	130	0	40	0	0	0	0	365	80	125	215	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	141	0	43	0	0	0	0	397	87	136	234	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	946	989	234	989	946	440	234	484				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	946	989	234	989	946	440	234	484				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	35	100	95	100	100	100	100	87				
cM capacity (veh/h)	218	216	805	193	229	617	1334	1079				
Direction, Lane #	EB 1	NB 1	SB 1	SB 2								
Volume Total	185	484	136	234								
Volume Left	141	0	136	0								
Volume Right	43	87	0	0								
cSH	263	1700	1079	1700								
Volume to Capacity	0.70	0.26	0.13	0.14								
Queue Length 95th (ft)	119	0	11	0								
Control Delay (s)	45.4	0.0	8.8	0.0								
Lane LOS	E	A	A	A								
Approach Delay (s)	45.4	0.0	3.2									
Approach LOS	E											
Intersection Summary												
Average Delay	9.2											
Intersection Capacity Utilization	74.2%											
Analysis Period (min)	15											
ICU Level of Service												
D												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
6: Atherton Rd. & Airport Way

Existing Conditions

AM

																					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR									
Lane Configurations																					
Sign Control	Stop			Stop			Free			Free											
Grade	0%			0%			0%			0%											
Volume (veh/h)	90	5	0	0	5	85	5	270	5	35	170	50									
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92									
Hourly flow rate (vph)	98	5	0	0	5	92	5	293	5	38	185	54									
Pedestrians																					
Lane Width (ft)																					
Walking Speed (ft/s)																					
Percent Blockage																					
Right turn flare (veh)																					
Median type	None																				
Median storage (veh)																					
Upstream signal (ft)																					
pX, platoon unblocked																					
vC, conflicting volume	660	571	185	568	620	293	239	299													
vC1, stage 1 conf vol																					
vC2, stage 2 conf vol																					
vCu, unblocked vol	660	571	185	568	620	293	239	299													
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1													
tC, 2 stage (s)																					
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2													
p0 queue free %	69	99	100	100	99	88	100	97													
cM capacity (veh/h)	318	416	857	418	390	746	1328	1262													
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3									
Volume Total	98	5	0	0	5	92	5	293	5	38	185	54									
Volume Left	98	0	0	0	0	0	5	0	0	38	0	0									
Volume Right	0	0	0	0	0	92	0	0	5	0	0	54									
cSH	318	416	1700	1700	390	746	1328	1700	1700	1262	1700	1700									
Volume to Capacity	0.31	0.01	0.00	0.00	0.01	0.12	0.00	0.17	0.00	0.03	0.11	0.03									
Queue Length 95th (ft)	32	1	0	0	1	11	0	0	0	2	0	0									
Control Delay (s)	21.3	13.8	0.0	0.0	14.4	10.5	7.7	0.0	0.0	7.9	0.0	0.0									
Lane LOS	C	B	A	A	B	B	A	A	A	A	A	A									
Approach Delay (s)	20.9						10.7					1.1									
Approach LOS	C						B					A									
Intersection Summary																					
Average Delay	4.5																				
Intersection Capacity Utilization	39.2%																				
Analysis Period (min)	15																				
ICU Level of Service																					
A																					

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
7: Woodward & Airport Way

Existing Conditions

AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Volume (vph)	65	20	25	10	25	60	20	155	10	15	120	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	22	27	11	27	65	22	168	11	16	130	38
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	120	103	201	185								
Volume Left (vph)	71	11	22	16								
Volume Right (vph)	27	65	11	38								
Hadj (s)	0.02	-0.32	0.02	-0.07								
Departure Headway (s)	5.0	4.7	4.7	4.6								
Degree Utilization, x	0.17	0.13	0.26	0.24								
Capacity (veh/h)	659	696	723	728								
Control Delay (s)	9.0	8.4	9.4	9.1								
Approach Delay (s)	9.0	8.4	9.4	9.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	9.0											
HCM Level of Service	A											
Intersection Capacity Utilization	33.3%			ICU Level of Service			A					
Analysis Period (min)	15											

Manteca
9: Daniels Street & Junction Drive

Existing Conditions
AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	Free	Free	Free	Free	Stop	Stop
Sign Control	0%	0%	0%	0%	0%	0%
Grade	10	20	75	5	10	25
Volume (veh/h)	0.92	0.92	0.92	0.92	0.92	0.92
Peak Hour Factor	11	22	82	5	11	27
Hourly flow rate (vph)						
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	87				128	84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	87				128	84
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	99				99	97
cM capacity (veh/h)	1509				861	975
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	33	87	38			
Volume Left	11	0	11			
Volume Right	0	5	27			
cSH	1509	1700	939			
Volume to Capacity	0.01	0.05	0.04			
Queue Length 95th (ft)	1	0	3			
Control Delay (s)	2.5	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	2.5	0.0	9.0			
Approach LOS	A		A			
Intersection Summary						
Average Delay	2.7					
Intersection Capacity Utilization	18.3%			ICU Level of Service	A	
Analysis Period (min)	15					

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
10: Daniels Street & Winters Drive

Existing Conditions
AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	Free	Free	Free	Free	Stop	Stop
Sign Control	0%	0%	0%	0%	0%	0%
Grade	20	25	30	40	35	55
Volume (veh/h)	0.92	0.92	0.92	0.92	0.92	0.92
Peak Hour Factor	22	27	33	43	38	60
Hourly flow rate (vph)						
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	76				125	54
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	76				125	54
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	99				96	94
cM capacity (veh/h)	1523				857	1013
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	49	76	98			
Volume Left	22	0	38			
Volume Right	0	43	60			
cSH	1523	1700	946			
Volume to Capacity	0.01	0.04	0.10			
Queue Length 95th (ft)	1	0	9			
Control Delay (s)	3.3	0.0	9.2			
Lane LOS	A		A			
Approach Delay (s)	3.3	0.0	9.2			
Approach LOS	A		A			
Intersection Summary						
Average Delay	4.8					
Intersection Capacity Utilization	21.1%			ICU Level of Service	A	
Analysis Period (min)	15					

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
11: Yosemite Avenue & Union Road

Existing Conditions
AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
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	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt	1.00	1.00	0.85	1.00	0.96	1.00	0.97	1.00	0.95	1.00	0.95	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3406	1770	3423	1770	3368	1770	3368	1770
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3406	1770	3423	1770	3368	1770	3368	1770
Volume (vph)	170	225	120	85	270	90	145	320	90	80	335	160
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)	185	245	130	92	293	98	158	348	98	87	364	174
RTOR Reduction (vph)	0	0	96	0	44	0	0	29	0	0	67	0
Lane Group Flow (vph)	185	245	34	92	347	0	158	417	0	87	471	0
Turn Type	Prot	Perm	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	11.2	18.8	18.8	6.1	13.7		9.4	25.0		6.6	22.2	
Effective Green, g (s)	11.2	18.8	18.8	6.1	13.7		9.4	25.0		6.6	22.2	
Actuated g/C Ratio	0.15	0.26	0.26	0.08	0.19		0.13	0.34		0.09	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	273	483	410	149	644		229	1180		161	1031	
v/s Ratio Prot	c0.10	c0.13		0.05	0.10		c0.09	c0.12		0.05	c0.14	
v/s Ratio Perm			0.02									
v/c Ratio	0.68	0.51	0.08	0.62	0.54		0.69	0.35		0.54	0.46	
Uniform Delay, d1	28.9	22.9	20.3	32.1	26.5		30.2	17.7		31.5	20.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.5	0.8	0.1	7.4	0.9		8.4	0.8		3.7	1.5	
Delay (s)	35.5	23.7	20.4	39.5	27.4		38.5	18.6		35.2	21.7	
Level of Service	D	C	C	D	C		D	B		D	C	
Approach Delay (s)	26.8			29.7			23.8			23.6		
Approach LOS	C			C			C			C		
Intersection Summary												
HCM Average Control Delay	25.8											
HCM Volume to Capacity ratio	0.56											
Actuated Cycle Length (s)	72.5						16.0					
Intersection Capacity Utilization	55.5%						ICU Level of Service	B				
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
12: Wawona St. & Union Road

Existing Conditions
AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
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	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt	1.00	0.91	1.00	0.93	1.00	0.98	1.00	0.98	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1691	1770	1736	1770	3484	1770	3484	1770	1863	1583	1770
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1691	1770	1736	1770	3484	1770	3484	1770	1863	1583	1770
Volume (vph)	55	75	120	145	85	70	80	430	50	75	455	10
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)	60	82	130	158	92	76	87	467	54	82	495	11
RTOR Reduction (vph)	0	96	0	0	48	0	0	10	0	0	0	10
Lane Group Flow (vph)	60	116	0	158	120	0	87	511	0	82	495	1
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												
Actuated Green, G (s)	3.4	9.8		6.0	12.4		4.7	27.3		4.6	27.2	3.4
Effective Green, g (s)	3.4	9.8		6.0	12.4		4.7	27.3		4.6	27.2	3.4
Actuated g/C Ratio	0.05	0.15		0.09	0.19		0.07	0.43		0.07	0.43	0.05
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	94	260		167	338		131	1493		128	796	84
v/s Ratio Prot	0.03	0.07		c0.09	c0.07		c0.05	0.15		0.05	c0.27	0.01
v/s Ratio Perm												
v/c Ratio	0.64	0.44		0.95	0.36		0.66	0.34		0.64	0.62	0.01
Uniform Delay, d1	29.5	24.5		28.7	22.2		28.7	12.2		28.7	14.2	28.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.4	1.2		53.4	0.6		12.0	0.6		10.5	3.6	0.0
Delay (s)	42.9	25.7		82.1	22.8		40.7	12.8		39.2	17.9	28.6
Level of Service	D	C		F	C		D	B		D	B	C
Approach Delay (s)	29.5			51.6			16.8			21.1		
Approach LOS	C			D			B			C		
Intersection Summary												
HCM Average Control Delay	26.4											
HCM Volume to Capacity ratio	0.61											
Actuated Cycle Length (s)	63.7						16.0					
Intersection Capacity Utilization	61.1%						ICU Level of Service	B				
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Manteca
13: Daniels Street & Union Road

Existing Conditions
AM

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	35	70	45	525	695	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	76	49	571	755	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1438	769	783			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1438	769	783			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	72	81	94			
cM capacity (veh/h)	138	401	835			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	114	620	783			
Volume Left	38	49	0			
Volume Right	76	0	27			
cSH	245	835	1700			
Volume to Capacity	0.47	0.06	0.46			
Queue Length 95th (ft)	57	5	0			
Control Delay (s)	31.8	1.5	0.0			
Lane LOS	D	A				
Approach Delay (s)	31.8	1.5	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay		3.0				
Intersection Capacity Utilization		77.8%		ICU Level of Service	D	
Analysis Period (min)		15				

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
14: SR 120 WB Ramps & Union Road

Existing Conditions
AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	0	0	0	25	0	245	30	325	0	0	400	365
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	27	0	266	33	353	0	0	435	397
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1318	1052	633	1052	1250	353	832			353		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1318	1052	633	1052	1250	353	832			353		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	86	100	61	96			100		
cM capacity (veh/h)	80	217	480	195	166	690	801			1205		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1								
Volume Total	293	33	353	832								
Volume Left	27	33	0	0								
Volume Right	266	0	0	397								
cSH	581	801	1700	1700								
Volume to Capacity	0.52	0.04	0.21	0.49								
Queue Length 95th (ft)	75	3	0	0								
Control Delay (s)	18.2	9.7	0.0	0.0								
Lane LOS	C	A										
Approach Delay (s)	18.2	0.8		0.0								
Approach LOS	C											
Intersection Summary												
Average Delay		3.7										
Intersection Capacity Utilization		73.2%		ICU Level of Service	D							
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
15: SR 120 EB Ramps & Union Road

Existing Conditions
AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	120	0	10	0	0	0	235	30	215	210	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	0	11	0	0	0	255	33	234	228	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	967	984	228	978	967	272	228			288		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	967	984	228	978	967	272	228			288		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	35	100	99	100	100	100	100			82		
cM capacity (veh/h)	201	203	811	195	207	767	1340			1274		
Direction, Lane #	EB 1	NB 1	SB 1	SB 2								
Volume Total	141	288	234	228								
Volume Left	130	0	234	0								
Volume Right	11	33	0	0								
cSH	213	1700	1274	1700								
Volume to Capacity	0.66	0.17	0.18	0.13								
Queue Length 95th (ft)	102	0	17	0								
Control Delay (s)	50.0	0.0	8.5	0.0								
Lane LOS	F	A										
Approach Delay (s)	50.0	0.0	4.3									
Approach LOS	F											
Intersection Summary												
Average Delay		10.2										
Intersection Capacity Utilization		73.2%		ICU Level of Service	D							
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
17: Woodward & Union Road

Existing Conditions
AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	15	25	0	30	20	65	50	185	25	35	155	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	27	0	33	22	71	54	201	27	38	168	33
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	43	125	283	239								
Volume Left (vph)	16	33	54	38								
Volume Right (vph)	0	71	27	33								
Hadj (s)	0.11	-0.25	0.01	-0.02								
Departure Headway (s)	5.4	4.9	4.7	4.7								
Degree Utilization, x	0.07	0.17	0.37	0.31								
Capacity (veh/h)	583	654	743	732								
Control Delay (s)	8.8	9.0	10.3	9.8								
Approach Delay (s)	8.8	9.0	10.3	9.8								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay		9.8										
HCM Level of Service		A										
Intersection Capacity Utilization		34.5%		ICU Level of Service	A							
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Line Configurations													
Actual Flow (vph)	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		
Line Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Frt	1.00	0.96		1.00	0.93		1.00	1.00	0.85	1.00	0.99		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	3411		1770	3295		1770	1863	1583	1770	1839		
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	1770	3411		1770	3295		1770	1863	1583	1770	1839		
Volume (vph)	55	330	105	115	170	145	40	205	150	195	265	25	
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)	60	359	114	125	186	158	43	223	163	212	288	27	
RTOR Reduction (vph)	0	39	0	0	120	0	0	0	108	0	3	0	
Line Group Flow (vph)	60	434	0	125	223	0	43	223	55	212	312	0	
Turn Type	Prot			Prot			Prot		Perm	Prot			
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases									2				
Actuated Green, G (s)	4.2	14.3		7.5	17.6		4.1	24.6	24.6	10.5	31.0		
Effective Green, g (s)	4.2	14.3		7.5	17.6		4.1	24.6	24.6	10.5	31.0		
Actuated g/C Ratio	0.06	0.20		0.10	0.24		0.06	0.34	0.34	0.14	0.43		
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0		
Line Grp Cap (vph)	102	669		182	795		100	629	534	255	782		
v/s Ratio Prot	0.03	c0.13		c0.07	c0.07		0.02	0.12		c0.12	c0.17		
v/s Ratio Perm									0.03				
v/c Ratio	0.59	0.65		0.69	0.28		0.43	0.35	0.10	0.83	0.40		
Uniform Delay, d1	33.5	27.0		31.6	22.5		33.3	18.2	16.6	30.3	14.5		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	8.4	2.2		10.3	0.2		3.0	1.6	0.4	20.0	1.5		
Delay (s)	41.9	29.2		41.8	22.7		36.2	19.7	17.0	50.4	16.0		
Level of Service	D	C		D	C		D	B	B	D	B		
Approach Delay (s)		30.6			27.8			20.3			29.8		
Approach LOS		C			C			C			C		
Intersection Summary													
HCM Average Control Delay	27.5						HCM Level of Service						C
HCM Volume to Capacity ratio	0.58												
Actuated Cycle Length (s)	72.9						Sum of lost time (s)						16.0
Intersection Capacity Utilization	53.6%						ICU Level of Service						A
Analysis Period (min)	15												
c. Critical Lane Group													

Fehr & Peers Associates, Inc.

Synchro 6 Report

Existing Conditions

	WBL	WBR	NBT	NBR	SBL	SBT
Movement						
Lane Configurations	W					W
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	85	45	350	130	65	420
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	49	380	141	71	457
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn lane (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)			1313			
pX, platoon unblocked	0.85	0.85			0.85	
vC, conflicting volume	1049	451			522	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCU, unblocked vol	1057	356			439	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	53	92			93	
cM capacity (veh/h)	197	586			955	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	141	522	527			
Volume Left	92	0	71			
Volume Right	49	141	0			
cSH	255	1700	955			
Volume to Capacity	0.55	0.31	0.07			
Queue Length 95th (ft)	77	0	6			
Control Delay (s)	35.3	0.0	2.0			
Lane LOS	E		A			
Approach Delay (s)	35.3	0.0	2.0			
Approach LOS	E					
Intersection Summary						
Average Delay		5.1				
Intersection Capacity Utilization		69.5%		ICU Level of Service		C
Analysis Period (min)		15				

Fehr & Peers Associates, Inc.

Synchro 6 Report

Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑	↱	↰	↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd Flow (prot fl)	3433	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	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	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	20	5	30	50	5	10	75	450	110	5	460	30
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)	22	5	33	54	5	11	82	489	120	16	500	33
RTOR Reduction (vph)	0	0	28	0	0	9	0	0	69	0	0	12
Lane Group Flow (vph)	22	5	5	54	5	2	82	489	51	16	500	21
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	B		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	6.4	8.3	8.3	6.5	8.4	8.4	4.0	23.1	23.1	0.8	19.9	19.9
Effective Green, g (s)	6.4	8.3	8.3	6.5	8.4	8.4	4.0	23.1	23.1	0.8	19.9	19.9
Actuated g/C Ratio	0.12	0.15	0.15	0.12	0.15	0.15	0.07	0.42	0.42	0.01	0.36	0.36
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	4.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Cap (vph)	402	283	240	210	286	243	128	787	669	26	678	576
v/s Ratio	0.01	0.00		0.03	0.00		0.05	0.26		0.01	0.27	
v/s Ratio Perm			0.00						0.03			0.01
v/c Ratio	0.05	0.02	0.02	0.26	0.02	0.01	0.64	0.62	0.08	0.62	0.74	0.04
Uniform Flow, d1	21.5	19.7	19.7	21.9	19.6	19.6	24.6	12.4	9.4	26.8	15.1	11.2
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	0.1	0.0	0.0	0.7	0.0	0.0	9.8	1.5	0.0	36.3	4.2	0.0
Delay (s)	21.5	19.8	19.8	22.6	19.7	19.6	34.5	13.9	9.5	63.1	19.3	11.2
Level of Service	C	B	B	C	B	B	C	B	A	E	B	B
Approach Delay (s)	20.4			21.9			15.6			20.1		
Approach LOS	C			C			B			C		
Intersection Summary												
HCM Average Control Delay	17.9			HCM Level of Service						B		
HCM Volume to Capacity ratio	0.53											
Actuated Cycle Length (s)	54.7			Sum of lost time (s)								
Intersection Capacity Utilization	47.8%			ICU Level of Service						A		
Analysis Period (min)	15											
c. Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Existing Conditions
RM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	0	0	0	90	0	140	55	495	0	0	385	155
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	98	0	152	60	538	0	0	418	168
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right Turn Lane (veh)	None			None								
Median type												
Median storage veh												
Upstream signal (ft)												494
pX, platoon unblocked	0.75	0.75	0.75	0.75	0.75	0.75	0.75					
vC, conflicting volume	1312	1160	503	1160	1245	538	587			538		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1414	1213	341	1213	1324	538	452			538		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
pQ queue free %	100	100	100	100	100	100	72	93		100		
cM capacity (veh/h)	59	127	529	113	109	543	836			1030		
Direction_Lane #	WB1	NB1	NB2	SB1								
Volume Total	250	60	538	587								
Volume Left	98	60	0	0								
Volume Right	152	0	0	168								
cSH	218	836	1700	1700								
Volume to Capacity	1.14	0.07	0.32	0.35								
Queue Length 95th (ft)	296	6	0	0								
Control Delay (s)	151.7	9.6	0.0	0.0								
Lane LOS	F	A										
Approach Delay (s)	151.7	1.0	0.0									
Approach LOS	F											
Intersection Summary												
Average Delay	26.8											
Intersection Capacity Utilization	85.1%											
ICU Level of Service	C											
Analysis Period (min)	15											

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
5: SR 120 EB & Airport Way

Existing Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	300	0	175	0	0	0	0	250	95	160	315	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	326	0	190	0	0	0	0	272	103	174	342	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1014	1065	342	1204	1014	323	342				375	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1014	1065	342	1204	1014	323	342				375	
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	0	100	73	100	100	100	100				85	
cM capacity (veh/h)	193	190	700	104	204	718	1217				1183	
Direction, Lane #	EB 1	NB 1	SB 1	SB 2								
Volume Total	516	375	174	342								
Volume Left	326	0	174	0								
Volume Right	190	103	0	0								
cSH	263	1700	1183	1700								
Volume to Capacity	1.96	0.22	0.15	0.20								
Queue Length 95th (ft)	923	0	13	0								
Control Delay (s)	478.7	0.0	8.6	0.0								
Lane LOS	F		A									
Approach Delay (s)	478.7	0.0	2.9									
Approach LOS	F		A									
Intersection Summary												
Average Delay	176.6											
Intersection Capacity Utilization	65.1%											
ICU Level of Service	C											
Analysis Period (min)	15											

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
6: Atherton Rd. & Airport Way

Existing Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	85	5	5	5	5	90	5	170	10	100	255	135
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	5	5	5	5	98	5	185	11	109	277	147
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	791	701	277	698	837	185	424				196	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	791	701	277	698	837	185	424				196	
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	63	98	99	98	98	89	100				92	
cM capacity (veh/h)	251	333	762	326	278	857	1135				1377	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	92	5	5	5	5	98	5	185	11	109	277	147
Volume Left	92	0	0	5	0	0	5	0	0	109	0	0
Volume Right	0	0	5	0	0	98	0	0	11	0	0	147
cSH	251	333	762	326	278	857	1135	1700	1700	1377	1700	1700
Volume to Capacity	0.37	0.02	0.01	0.02	0.02	0.11	0.00	0.11	0.01	0.08	0.16	0.09
Queue Length 95th (ft)	40	1	1	1	1	10	0	0	0	6	0	0
Control Delay (s)	27.4	16.0	9.8	16.2	18.2	9.7	8.2	0.0	0.0	7.8	0.0	0.0
Lane LOS	D	C	A	C	C	A	A				A	
Approach Delay (s)	25.9				10.5				0.2	1.6		
Approach LOS	D				B				A	A		
Intersection Summary												
Average Delay	5.0											
Intersection Capacity Utilization	38.1%											
Analysis Period (min)	15											
ICU Level of Service	A											

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
7: Woodward & Airport Way

Existing Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Volume (vph)	35	50	20	10	25	35	20	115	10	65	130	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	54	22	11	27	38	22	125	11	71	141	76
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	114	76	158	288								
Volume Left (vph)	38	11	22	71								
Volume Right (vph)	22	38	11	76								
Hadj (s)	-0.01	-0.24	0.02	-0.06								
Departure Headway (s)	5.0	4.9	4.8	4.5								
Degree Utilization, x	0.16	0.10	0.21	0.36								
Capacity (veh/h)	647	659	715	760								
Control Delay (s)	9.0	8.4	9.0	10.0								
Approach Delay (s)	9.0	8.4	9.0	10.0								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay				9.4								
HCM Level of Service				A								
Intersection Capacity Utilization	42.8%			ICU Level of Service						A		
Analysis Period (min)	15											

Existing Conditions
PM

	EBL	EBT	WBT	WBR	SBL	SBR
Movement						
Lane Configurations		4	1		1	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	20	60	35	20	10	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	65	38	22	11	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	60				158	49
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCv, unblocked vol	60				158	49
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	99				99	98
cM capacity (veh/h)	1544				822	1020
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	87	60	27			
Volume Left	22	0	11			
Volume Right	0	22	16			
cSH	1544	1700	930			
Volume to Capacity	0.01	0.04	0.03			
Queue Length 95th (ft)	1	0	2			
Control Delay (s)	1.9	0.0	9.0			
Lane LOS	A	A	A			
Approach Delay (s)	1.9	0.0	9.0			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay		2.4				
Intersection Capacity Utilization		20.9%		ICU Level of Service		A
Analysis Period (min)		15				

Fehr & Peers Associates, Inc.

Synchro 6 Report

Existing Conditions
PM

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
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	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95									
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.96		1.00	0.96									
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00									
Satd. Flow (prot)	1770	1863	1583	1770	3408		1770	3476		1770	3397									
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00									
Satd. Flow (perm)	1770	1863	1583	1770	3408		1770	3476		1770	3397									
Volume (vph)	180	345	210	90	275	90	100	555	75	100	410	150								
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								
Act. Flow (vph)	198	375	228	98	299	98	109	603	82	109	446	163								
TDOR Reduction (vph)	0	0	169	0	42	0	0	12	0	0	42	0								
Lane Group Flow (vph)	196	375	59	98	355	0	109	673	0	109	567	0								
Turn Type	Prot		Perm	Prot			Prot			Prot										
Protected Phases	7	4		3	8		5	2		1	6									
Permitted Phases			4																	
Actuated Green, G (s)	9.1	18.3	18.3	5.8	15.0		6.8	23.8		6.3	23.3									
Effective Green, g (s)	9.1	18.3	18.3	5.8	15.0		6.8	23.8		6.3	23.3									
Actuated g/C Ratio	0.13	0.26	0.26	0.08	0.21		0.10	0.34		0.09	0.33									
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0									
Van Gap Cap (vph)	229	486	413	146	728		171	178		159	1127									
v/s Ratio Prot	c0.11	c0.20		0.06	0.10		c0.05	c0.19		0.06	0.17									
v/s Ratio Perm			0.04																	
v/c Ratio	0.86	0.77	0.14	0.67	0.49		0.64	0.57		0.69	0.50									
Unitic Delay, c1	29.9	24.0	19.9	31.3	24.2		30.5	19.0		31.0	18.8									
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00									
Incremental Delay, d2	25.5	7.4	0.2	11.5	0.5		7.6	2.0		11.6	1.6									
Delay (s)	55.4	31.5	20.1	42.8	24.7		38.1	21.0		42.6	20.4									
Level of Service	E	C	C	D	D		C	D		C	D									
Approach Delay (s)		34.1	C		28.3	C		23.4	C		23.6	C								
Approach LOS			C			C						C								
Intersection Summary																				
HCM Average Control Delay	27.4					HCM Level of Service					C									
HCM Volume to Capacity ratio	0.66																			
Actuated Cycle Length (s)	70.2					Sum of lost time (s)					12.0									
Intersection Capacity Utilization	59.7%					ICU Level of Service					B									
Analysis Period (min)	15																			
c. Critical Lane Group																				

Fehr & Peers Associates, Inc.

Synchro 6 Report

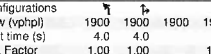
Existing Conditions
PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4	1			
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	35	35	50	25	30	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	38	54	27	33	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	82				182	68
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	82				182	68
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	97				96	97
cM capacity (veh/h)	1516				787	995
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	76	82	60			
Volume Left	38	0	33			
Volume Right	0	27	27			
cSH	1516	1700	870			
Volume to Capacity	0.03	0.65	0.07			
Queue Length 95th (ft)	2	0	6			
Control Delay (s)	3.8	0.0	9.4			
Lane LOS	A	A	A			
Approach Delay (s)	3.8	0.0	9.4			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay		3.9				
Intersection Capacity Utilization		20.4%		ICU Level of Service		A
Analysis Period (min)		15				

Fehr & Peers Associates, Inc.

Synchro 6 Report

Existing Conditions
PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1 $\uparrow$ 1 $\downarrow$			1 $\uparrow$ 1 $\downarrow$			1 $\uparrow$ 1 $\downarrow$			1 $\uparrow$ 1 $\downarrow$		
Initial Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost (s/c)	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt	1.00	0.94	1.00	0.91	1.00	0.97	1.00	0.97	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	1755	1770	1704	1770	1704	1770	3439	1770	1863	1583	1863
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	1755	1770	1704	1770	1704	1770	3439	1770	1863	1583	1863
Volume (vph)	45	95	60	75	95	125	90	625	145	165	425	90
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)	49	103	65	82	103	136	98	679	158	166	462	76
RTOR Reduction (vph)	0	37	0	0	37	0	0	36	0	0	0	70
Lane Group Flow (vph)	49	131	0	82	161	0	98	811	0	168	482	6
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7			3			5			1		
Permitted Phases	4			8			2			6		
Overlapped Phases												
Actuated Green, G (s)	4.6	11.1		4.6	11.1		4.6	22.4		7.9	25.7	4.6
Effective Green, g (s)	4.6	11.1		4.6	11.1		4.6	22.4		7.9	25.7	4.6
Actuated g/C Ratio	0.07	0.18		0.07	0.18		0.07	0.36		0.13	0.41	0.07
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	131	314		131	305		131	1242		226	772	171
v/s Ratio Prot	0.03	0.07		c0.05	c0.09		0.06	0.24		c0.09	c0.25	0.00
v/s Ratio Perm												
v/c Ratio	0.37	0.42		0.63	0.53		0.75	0.65		0.74	0.60	0.05
Uniform Delay, d1	27.3	22.6		27.9	23.1		28.1	16.6		26.1	14.1	26.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.8	0.9		9.0	1.7		20.6	2.7		12.4	3.4	0.2
Delay (s)	29.1	23.5		36.9	24.7		48.7	19.2		38.5	17.5	26.8
Level of Service	C	C		D	C		D	B		D	B	C
Approach Delay (s)	24.8			27.8			22.3			23.5		
Approach LOS	C			D			C			C		
Intersection Summary												
HCM Average Control Delay	23.8			HCM Level of Service						C		
HCM Volume to Capacity ratio	0.62											
Actuated Cycle Length (s)	62.0			Sum of lost time (s)						16.0		
Intersection Capacity Utilization	59.8%			ICU Level of Service						B		
Analysis Period (min)	15											
c. Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
13: Daniels Street & Union Road

Existing Conditions
PM

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	35	60	80	845	505	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	65	87	918	549	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1660	568	587			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1660	568	587			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	61	88	91			
cM capacity (veh/h)	98	522	988			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	103	1005	587			
Volume Left	38	87	0			
Volume Right	65	0	38			
cSH	201	968	1700			
Volume to Capacity	0.51	0.09	0.35			
Queue Length 95th (ft)	65	7	0			
Control Delay (s)	40.5	2.4	0.0			
Lane LOS	E	A				
Approach Delay (s)	40.5	2.4	0.0			
Approach LOS	E					
Intersection Summary						
Average Delay		3.9				
Intersection Capacity Utilization		93.2%		ICU Level of Service	F	
Analysis Period (min)		15				

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
14: SR 120 WB Ramps & Union Road

Existing Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	15%	0%	0%	335%	15%	590%	0%	0%	415%
Volume (veh/h)	0	0	0	15	0	0	364	16	641	0	0	451
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	16	0	0	364	16	641	0	0	451
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1571	1207	533	1207	1288	641	614				641	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1571	1207	533	1207	1288	641	614				641	
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	100	90	100	23	98				100	
cM capacity (veh/h)	21	180	547	158	161	475	965				943	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1								
Volume Total	380	16	641	614								
Volume Left	16	16	0	0								
Volume Right	364	0	0	163								
cSH	437	965	1700	1700								
Volume to Capacity	0.87	0.02	0.38	0.36								
Queue Length 95th (ft)	223	1	0	0								
Control Delay (s)	47.9	8.8	0.0	0.0								
Lane LOS	E	A										
Approach Delay (s)	47.9	0.2		0.0								
Approach LOS	E											
Intersection Summary												
Average Delay		11.1										
Intersection Capacity Utilization		65.9%		ICU Level of Service	C							
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
15: SR 120 EB Ramps & Union Road

Existing Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	455	0	40	0	0	0	150	5	250	180	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	495	0	43	0	0	0	163	5	272	196	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	905	908	196	948	905	166	196			168		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	905	908	196	948	905	166	196			168		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	95	100	100	100	100			81		
cM capacity (veh/h)	219	222	846	194	223	879	1377			1409		
Direction, Lane #	EB 1	NB 1	SB 1	SB 2								
Volume Total	538	168	272	196								
Volume Left	495	0	272	0								
Volume Right	43	5	0	0								
cSH	233	1700	1409	1700								
Volume to Capacity	2.31	0.10	0.19	0.12								
Queue Length 95th (ft)	1070	0	18	0								
Control Delay (s)	634.6	0.0	8.2	0.0								
Lane LOS	F	A										
Approach Delay (s)	634.6	0.0	4.7									
Approach LOS	F											
Intersection Summary												
Average Delay		292.7										
Intersection Capacity Utilization		65.9%		ICU Level of Service	C							
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
17: Woodward & Union Road

Existing Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	15%	105%	5%	15%	50%	70%	5%	70%	15%	95%	105%	20%
Volume (veh/h)	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Peak Hour Factor	16	114	5	16	54	76	5	76	16	103	114	22
Hourly flow rate (vph)												
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	905	908	196	948	905	166	196			168		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	905	908	196	948	905	166	196			168		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	95	100	100	100	100			81		
cM capacity (veh/h)	219	222	846	194	223	879	1377			1409		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	136	147	96	239								
Volume Left (vph)	16	16	5	103								
Volume Right (vph)	5	76	16	22								
Hadj (s)	0.03	-0.25	-0.05	0.07								
Departure Headway (s)	5.0	4.7	4.9	4.8								
Degree Utilization, x	0.19	0.19	0.13	0.32								
Capacity (veh/h)	666	708	661	706								
Control Delay (s)	9.1	8.8	8.6	10.0								
Approach Delay (s)	9.1	8.8	8.6	10.0								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay		9.3										
HCM Level of Service		A										
Intersection Capacity Utilization		35.4%		ICU Level of Service	A							
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Existing Plus Project Conditions

AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	113	45	437	98	50	460
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	123	49	475	107	54	500
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)	1313					
pX, platoon unblocked	0.78	0.78			0.78	
vC, conflicting volume	1137	528			582	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCU, unblocked vol	1176	394			463	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	20	90			94	
cM capacity (veh/h)	154	510			856	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	172	582	554			
Volume Left	123	0	54			
Volume Right	49	107	0			
cSH	192	1700	856			
Volume to Capacity	0.89	0.34	0.06			
Queue Length 95th (ft)	171	0	5			
Control Delay (s)	89.5	0.0	1.7			
Lane LOS	F		A			
Approach Delay (s)	89.5	0.0	1.7			
Approach LOS	F					
Intersection Summary						
Average Delay	12.5					
Intersection Capacity Utilization	74.9%		ICU Level of Service		D	
Analysis Period (min)	15					

Existing Plus Project Conditions

AM

[illegible]

AM

[illegible]

AM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Move Configuration		↑			↑			↑			↑	
Sign Control		Stop			Stop			Free			Free	
Grade		0%	0	0	0%	0	5	0%	5	39	173	54
Volume (veh/h)	95	5	0	0	5	90	5	274	0.92	39	173	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	5	0	0	5	98	5	298	5	42	188	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	682	587	188	584	640	298	247			303		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	682	587	188	584	640	298	247			303		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p queue free (s)	66	99	100	100	99	87	100			97		
cM capacity (veh/h)	303	406	854	407	378	742	1319			1258		
Direction, Lane #	EB1	EB2	EB3	WB1	WB2	WB3	NB1	NB2	NB3	SB1	SB2	SB3
Volume Total	103	5	0	0	5	98	5	298	5	42	188	58
Volume Left	103	0	0	0	0	0	5	0	0	42	0	0
Volume Right	0	0	0	0	0	98	0	0	5	0	0	58
cSH	303	406	1700	1700	378	742	1319	1700	1700	1258	1700	1700
Queue Length to Capacity	0.34	0.00	0.00	0.01	0.13	0.00	0.18	0.00	0.03	0.11	0.03	0.00
Queue Length 95th (ft)	37	1	0	0	1	11	0	0	0	3	0	0
Control Delay (s)	22.9	14.0	0.0	0.0	14.7	10.6	7.7	0.0	0.0	8.0	0.0	0.0
Lane LOS	C	B	A	A	B	B	A	A	A	B	A	A
Approach Delay (s)	22.4			10.8			0.1			1.2		
Approach LOS	C			B								
Intersection Summary												
Average Delay				4.9								
Intersection Capacity Utilization				39.7%						A		
Analysis Period (min)				15								

AM

7 Woodward & Airport Way												AM
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop											
Volume (vph)	65	20	25	10	25	60	20	159	10	15	123	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	22	27	11	27	65	22	173	11	16	134	38
Direction, Lane #	E1	W2	NB1	SB1								
Volume Total (vph)	120	103	205	188								
Volume Left (vph)	71	11	22	16								
Volume Right (vph)	27	65	11	38								
Head (s)	0.02	-0.32	0.02	-0.07								
Departure Headway (s)	5.0	4.7	4.7	4.7								
Degree Utilization, x	0.17	0.13	0.27	0.24								
Capacity (veh/h)	656	692	722	727								
Control Delay (s)	9.0	8.4	9.5	9.1								
Approach Delay (s)	9.0	8.4	9.5	9.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	9.1											
HCM Level of Service	A											
Intersection Capacity Utilization	33.5%				ICU Level of Service				A			
Analysis Period (min)	15											

AM

B. Daniels Street & Lowe's Site Driveway													AM
	←		→		↶		↷		↑		↓		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
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		
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.89		1.00	0.89		1.00	0.85		1.00	0.85		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1770	3132		1770	1829		1770	1592		1770	1592		
Frt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1770	3132		1770	1829		1770	1592		1770	1590		
Volume (vph)	50	46	151	34	106	15	142	1	28	5	2	80	
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)	54	50	164	37	115	16	154	1	30	5	2	87	
RTOR Reduction (vph)	0	128	0	0	6	0	0	23	0	0	70	0	
Lane Group Flow (vph)	54	86	0	37	125	0	154	8	0	5	19	0	
Turn Type	Prot		Prot		Prot		Prot		Prot		Prot		
Protected Phases	5		2		1		4		3		8		
Permitted Phases	5		2		1		4		3		8		
Actuated Green, G (s)	2.9		11.4		6.7		15.2		7.3		11.2		
Effective Green, g (s)	2.9		11.4		6.7		15.2		7.3		11.2		
Actuated g/C Ratio	0.06		0.22		0.13		0.30		0.14		0.22		
Clearance Time (s)	4.0		4.0		4.0		4.0		4.0		4.0		
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0		3.0		
Lane Grp Cap (vph)	100		696		231		542		252		348		
v/s Ratio Prot	c0.03		0.03		0.02		0.07		c0.09		0.00		
v/s Ratio Perm													
v/c Ratio	0.54		0.12		0.16		0.23		0.61		0.02		
Uniform Delay, d1	23.6		16.0		19.8		13.6		20.7		15.7		
Progression Factor	1.00		1.00		1.00		1.00		1.00		1.00		
Incremental Delay, d2	5.8		0.1		0.3		0.2		4.3		0.0		
Delay (s)	29.4		16.0		20.1		13.9		25.0		15.8		
Level of Service	C		B		C		B		C		B		
Approach Delay (s)	18.7				15.2				23.5				
Approach LOS	B				B				C				
Intersection Summary													
HCM Average Control Delay	18.9						HCM Level of Service				B		
HCM Volume to Capacity ratio	0.29												
Actuated Cycle Length (s)	51.3						Sum of lost time (s)				16.0		
Intersection Capacity Utilization	34.4%						ICU Level of Service				A		
Analysis Period (min)	15												
c. Critical Lane Group													

Manteca
9: Daniels Street & Junction Drive
Existing Plus Project Conditions
AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	Free	Free	Free	Free	Stop	Stop
Sign Control	0%	0%	0%	0%	0%	0%
Volume (veh/h)	12	57	119	5	10	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	62	129	5	11	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	135				220	132
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	135				220	132
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	99				99	97
cM capacity (veh/h)	1450				761	917
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	75	135	41			
Volume Left	13	0	11			
Volume Right	0	5	30			
cSH	1450	1700	870			
Volume to Capacity	0.01	0.08	0.05			
Queue Length 95th (ft)	1	0	4			
Control Delay (s)	1.4	0.0	9.3			
Lane LOS	A		A			
Approach Delay (s)	1.4	0.0	9.3			
Approach LOS	A		A			
Intersection Summary						
Average Delay		1.9				
Intersection Capacity Utilization		23.3%		ICU Level of Service	A	
Analysis Period (min)		15				

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
10: Daniels Street & Winters Drive
Existing Plus Project Conditions
AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	Free	Free	Free	Free	Stop	Stop
Sign Control	0%	0%	0%	0%	0%	0%
Volume (veh/h)	24	58	69	40	35	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	63	75	43	38	64
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	118				212	97
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	118				212	97
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	98				95	93
cM capacity (veh/h)	1470				763	960
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	89	118	102			
Volume Left	26	0	38			
Volume Right	0	43	64			
cSH	1470	1700	875			
Volume to Capacity	0.02	0.07	0.12			
Queue Length 95th (ft)	1	0	10			
Control Delay (s)	2.3	0.0	9.7			
Lane LOS	A		A			
Approach Delay (s)	2.3	0.0	9.7			
Approach LOS	A		A			
Intersection Summary						
Average Delay		3.8				
Intersection Capacity Utilization		23.3%		ICU Level of Service	A	
Analysis Period (min)		15				

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
11: Yosemite Avenue & Union Road
Existing Plus Project Conditions
AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	0.96	1.00	1.00	0.97	1.00	0.95	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)	1770	1863	1583	1770	3408	1770	3415	1770	3370	1770	3370	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)	1770	1863	1583	1770	3408	1770	3415	1770	3370	1770	3370	1583
Volume (vph)	170	227	121	95	273	90	146	327	99	80	343	160
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)	185	247	132	104	297	98	159	355	108	87	373	174
RTOR Reduction (vph)	0	0	98	0	43	0	0	32	0	0	65	0
Lane Group Flow (vph)	185	247	34	104	352	0	159	431	0	87	482	0
Turn Type	Prot	Perm	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	11.2	18.8	18.8	6.2	13.8		9.4	25.0		6.6	22.2	
Effective Green, g (s)	11.2	18.8	18.8	6.2	13.8		9.4	25.0		6.6	22.2	
Actuated g/C Ratio	0.15	0.26	0.26	0.09	0.19		0.13	0.34		0.09	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	273	482	410	151	648		229	1176		161	1030	
v/s Ratio Prot	c0.10	c0.13		0.06	0.10		c0.09	c0.13		0.05	c0.14	
v/s Ratio Perm			0.02									
w/c Ratio	0.68	0.51	0.08	0.69	0.54		0.69	0.37		0.54	0.47	
Uniform Delay, d1	29.0	23.0	20.4	32.3	26.6		30.2	17.9		31.5	20.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.5	0.9	0.1	12.3	0.9		8.8	0.9		3.7	1.5	
Delay (s)	35.5	23.9	20.5	44.6	27.5		39.0	18.7		35.2	21.9	
Level of Service	D	C	C	D	C		D	B		D	C	
Approach Delay (s)	26.9			31.1			23.9			23.8		
Approach LOS	C			C			C			C		
Intersection Summary												
HCM Average Control Delay		26.1				HCM Level of Service		C				
HCM Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		72.6				Sum of lost time (s)		16.0				
Intersection Capacity Utilization		55.9%				ICU Level of Service		B				
Analysis Period (min)		15										
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
12: Wawona St. & Union Road
Existing Plus Project Conditions
AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	1.00	1.00
Flt	1.00	0.91		1.00	0.93		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1690		1770	1736		1770	3482		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1690		1770	1736		1770	3482		1770	1863	1583
Volume (vph)	55	75	122	150	85	70	81	447	54	75	476	11
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)	60	82	133	163	92	76	88	486	59	82	517	11
RTOR Reduction (vph)	0	99	0	47	0	11	0	11	0	0	0	10
Lane Group Flow (vph)	60	116	0	163	121	0	88	534	0	82	517	1
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												
Actuated Green, G (s)	3.4	9.8		6.0	12.4		4.7	27.2		4.6	27.1	3.4
Effective Green, g (s)	3.4	9.8		6.0	12.4		4.7	27.2		4.6	27.1	3.4
Actuated g/C Ratio	0.05	0.15		0.09	0.19		0.07	0.43		0.07	0.43	0.05
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	95	260		167	338		131	1489		128	794	85
v/s Ratio Prot	0.03	0.07		c0.09	c0.07		c0.05	0.15		0.05	c0.28	0.00
v/s Ratio Perm												
w/c Ratio	0.63	0.45		0.98	0.36		0.67	0.36		0.64	0.65	0.01
Uniform Delay, d1	29.5	24.4		28.7	22.1		28.7	12.3		28.7	14.5	28.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.9	1.2		62.0	0.6		12.7	0.7		10.5	4.1	0.0
Delay (s)	42.4	25.7		90.7	22.8		41.4	13.0		39.2	18.6	28.5
Level of Service	D	C		F	C		D	B		D	B	C
Approach Delay (s)	29.3			56.2			16.9			21.6		
Approach LOS	C			E			B			C		
Intersection Summary												
HCM Average Control Delay	27.3						HCM Level of Service			C		
HCM Volume to Capacity ratio	0.63											
Actuated Cycle Length (s)	63.6						Sum of lost time (s)			16.0		
Intersection Capacity Utilization	62.6%						ICU Level of Service			B		
Analysis Period (min)	15											
c Critical Lane Group												

Manteca
13: Daniels Street & Union Road

Existing Plus Project Conditions
AM

Movement	EBL	EBT	EBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	NBL	NBT	NBR	SBL	SBT	SBR
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	64	75	50	525	695	59			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92			
Hourly flow rate (vph)	70	82	54	571	755	64			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type	None								
Median storage (veh)									
Upstream signal (ft)									
pX, platoon unblocked									
vC, conflicting volume	1467	788	820						
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	1467	788	820						
IC, single (s)	6.4	6.2	4.1						
IC, 2 stage (s)									
IF (s)	3.5	3.3	2.2						
p0 queue free %	47	79	93						
cM capacity (veh/h)	131	391	809						
Direction, Lane #	EB 1	NB 1	SB 1						
Volume Total	151	625	820						
Volume Left	70	54	0						
Volume Right	82	0	64						
cSH	205	809	1700						
Volume to Capacity	0.74	0.07	0.48						
Queue Length 95th (ft)	122	5	0						
Control Delay (s)	60.1	1.8	0.0						
Lane LOS	F	A							
Approach Delay (s)	60.1	1.8	0.0						
Approach LOS	F								
Intersection Summary									
Average Delay		6.4							
Intersection Capacity Utilization		84.0%		ICU Level of Service		E			
Analysis Period (min)		15							

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
14: SR 120 WB Ramps & Union Road

Existing Plus Project Conditions
AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	0	0	0	25	0	248	40	327	0	0	405	365
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	27	0	270	43	355	0	0	440	397
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1351	1081	639	1081	1279	355	837					
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1351	1081	639	1081	1279	355	837					
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					
p0 queue free %	100	100	100	85	100	51	95					
cM capacity (veh/h)	74	206	476	187	157	689	797					
Direction, Lane #	WB 1	NB 1	NB 2	SB 1								
Volume Total	297	43	355	837								
Volume Left	27	43	0	0								
Volume Right	270	0	0	397								
cSH	553	797	1700	1700								
Volume to Capacity	0.54	0.05	0.21	0.49								
Queue Length 95th (ft)	79	4	0	0								
Control Delay (s)	18.8	9.8	0.0	0.0								
Lane LOS	C	A										
Approach Delay (s)	18.8	1.1		0.0								
Approach LOS	C											
Intersection Summary												
Average Delay		3.9										
Intersection Capacity Utilization		73.7%		ICU Level of Service		D						
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
15: SR 120 EB Ramps & Union Road

Existing Plus Project Conditions
AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	120	0	18	0	0	0	0	247	30	218	212	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	0	20	0	0	0	0	258	33	237	230	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	989	1005	230	1009	989	285	230					
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	989	1005	230	1009	989	285	230					
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					
p0 queue free %	32	100	98	100	100	100	100					
cM capacity (veh/h)	193	196	809	183	200	754	1337					
Direction, Lane #	EB 1	NB 1	SB 1	SB 2								
Volume Total	150	301	237	230								
Volume Left	130	0	237	0								
Volume Right	20	33	0	0								
cSH	214	1700	1260	1700								
Volume to Capacity	0.70	0.18	0.19	0.14								
Queue Length 95th (ft)	112	0	17	0								
Control Delay (s)	53.5	0.0	8.5	0.0								
Lane LOS	F	A										
Approach Delay (s)	53.5	0.0	4.3									
Approach LOS	F											
Intersection Summary												
Average Delay		10.9										
Intersection Capacity Utilization		73.7%		ICU Level of Service		D						
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
17: Woodward & Union Road

Existing Plus Project Conditions
AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	15	25	0	30	20	73	50	189	25	42	158	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	27	0	33	22	79	54	205	27	46	172	33
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	43	134	287	250								
Volume Left (vph)	16	33	54	46								
Volume Right (vph)	0	79	27	33								
Had (s)	0.11	-0.27	0.02	-0.01								
Departure Headway (s)	5.5	5.0	4.7	4.7								
Degree Utilization, x	0.07	0.18	0.37	0.33								
Capacity (veh/h)	574	650	735	725								
Control Delay (s)	8.9	9.1	10.5	10.0								
Approach Delay (s)	8.9	9.1	10.5	10.0								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay		10.0										
ICU Level of Service		A										
Intersection Capacity Utilization		34.3%		ICU Level of Service		A						
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
18: Daniels Street & Lowe's Driveway 2
Existing Plus Project Conditions
AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	52	27	0	138	17	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	29	0	150	18	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)	494					
pX, platoon unblocked						
vC, conflicting volume			86		146	43
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			86		146	43
IC, single (s)			4.1		6.8	6.9
IC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1508		831	1018
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	38	48	75	75	28	28
Volume Left	0	0	0	0	18	18
Volume Right	0	29	0	0	10	10
cSH	1700	1700	1700	1700	888	888
Volume to Capacity	0.02	0.03	0.04	0.04	0.03	0.03
Queue Length 95th (ft)	0	0	0	0	2	2
Control Delay (s)	0.0	0.0	0.0	0.0	9.2	9.2
Lane LOS					A	A
Approach Delay (s)	0.0	0.0	0.0	0.0	9.2	9.2
Approach LOS					A	A
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			13.8%		ICU Level of Service	A
Analysis Period (min)			15			

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
19: Daniels Street & Lowe's Driveway 3
Existing Plus Project Conditions
AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	58	3	13	138	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	63	3	14	150	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)	917					
pX, platoon unblocked						
vC, conflicting volume			66		166	32
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			66		166	32
IC, single (s)			4.1		6.8	6.9
IC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1533		800	1035
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	32	32	3	14	75	75
Volume Left	0	0	0	14	0	0
Volume Right	0	0	3	0	0	0
cSH	1700	1700	1700	1533	1700	1700
Volume to Capacity	0.02	0.02	0.00	0.01	0.04	0.04
Queue Length 95th (ft)	0	0	0	1	0	0
Control Delay (s)	0.0	0.0	0.0	7.4	0.0	0.0
Lane LOS				A		
Approach Delay (s)	0.0	0.0	0.0	0.6	0.0	0.0
Approach LOS				F		
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			13.3%		ICU Level of Service	A
Analysis Period (min)			15			

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
1: Yosemite Avenue & Airport Way
Existing Plus Project Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vph)	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	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3411	1770	3295	1770	3295	1770	3411	1770	3295	1770	3411
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1770	3411	1770	3295	1770	3295	1770	3411	1770	3295	1770	3411
Volume (vph)	55	330	105	126	170	145	40	222	162	195	281	25
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)	60	359	114	137	185	158	43	241	176	212	305	27
RTOR Reduction (vph)	0	39	0	0	120	0	0	0	117	0	3	0
Lane Group Flow (vph)	60	434	0	137	223	0	43	241	59	212	329	0
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.2	14.3		7.6	17.7		4.1	24.6	24.6	10.5	31.0	
Effective Green, g (s)	4.2	14.3		7.6	17.7		4.1	24.6	24.6	10.5	31.0	
Actuated g/C Ratio	0.06	0.20		0.10	0.24		0.06	0.34	0.34	0.14	0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	102	668		184	799		99	628	533	255	781	
v/s Ratio Prot	0.03	c0.13		c0.08	c0.07		0.02	0.13		c0.12	c0.18	
v/s Ratio Perm												
v/c Ratio	0.59	0.65		0.74	0.28		0.43	0.38	0.11	0.83	0.42	
Uniform Delay, d1	33.6	27.0		31.8	22.5		33.3	16.4	16.7	30.4	14.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.4	2.3		15.0	0.2		3.0	1.9	0.4	20.0	1.7	
Delay (s)	41.9	29.3		46.8	22.7		36.4	20.2	17.1	50.4	16.4	
Level of Service	D	C		D	C		D	C	B	D	B	
Approach Delay (s)	30.7			29.5			20.5			29.6		
Approach LOS	C			C			C			C		
Intersection Summary												
HCM Average Control Delay			27.8				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			73.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			55.3%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
2: Wawona St. & Airport Way
Existing Plus Project Conditions
PM

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	92	45	379	137	65	447
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	49	412	149	71	486
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)			1313			
pX, platoon unblocked	0.83	0.83			0.83	
vC, conflicting volume	1114	486			561	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1138	378			468	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	41	91			92	
cM capacity (veh/h)	170	552			903	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	149	561	557			
Volume Left	100	0	71			
Volume Right	49	149	0			
cSH	220	1700	903			
Volume to Capacity	0.68	0.33	0.08			
Queue Length 95th (ft)	107	0	6			
Control Delay (s)	50.2	0.0	2.1			
Lane LOS	F	A	A			
Approach Delay (s)	50.2	0.0	2.1			
Approach LOS	F					
Intersection Summary						
Average Delay			6.8			
Intersection Capacity Utilization			73.3%		ICU Level of Service	D
Analysis Period (min)			15			

Fehr & Peers Associates, Inc.

Synchro 6 Report

Existing Plus Project Conditions
PM

Fehr & Peers Associates, Inc.

Existing Plus Project Conditions
PM

Fehr & Peers Associates, Inc

Existing Plus Project Conditions
PM

Fehr & Peers Associates, Inc.

Existing Plus Project Conditions
PM

Fehr & Peers Associates, Inc.

Manteca
7: Woodward & Airport Way
Existing Plus Project Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Volume (vph)	35	50	20	10	25	35	20	123	10	65	138	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	54	22	11	27	38	22	134	11	71	150	76
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total (vph)	114	76	166	297								
Volume Left (vph)	38	11	22	71								
Volume Right (vph)	22	38	11	76								
Hadj (s)	-0.01	-0.24	0.02	-0.07								
Departure Headway (s)	5.1	4.9	4.8	4.5								
Degree Utilization, x	0.16	0.10	0.22	0.37								
Capacity (veh/h)	640	651	712	757								
Control Delay (s)	9.1	8.5	9.1	10.2								
Approach Delay (s)	9.1	8.5	9.1	10.2								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay				9.5								
HCM Level of Service				A								
Intersection Capacity Utilization				43.7%								
Analysis Period (min)				15								

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
8: Daniels Street & Lowe's Site Driveway
Existing Plus Project Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Peak Hour Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1900	1805	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total (vph)	114	76	166	297								
Volume Left (vph)	38	11	22	71								
Volume Right (vph)	22	38	11	76								
Hadj (s)	-0.01	-0.24	0.02	-0.07								
Departure Headway (s)	5.1	4.9	4.8	4.5								
Degree Utilization, x	0.16	0.10	0.22	0.37								
Capacity (veh/h)	640	651	712	757								
Control Delay (s)	9.1	8.5	9.1	10.2								
Approach Delay (s)	9.1	8.5	9.1	10.2								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay				9.5								
HCM Level of Service				A								
Intersection Capacity Utilization				43.7%								
Analysis Period (min)				15								

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
9: Daniels Street & Junction Drive
Existing Plus Project Conditions
PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	4	4	4	4	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	25	152	121	20	10	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	165	132	22	11	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC1, conflicting volume	153				362	142
vC2, stage 1 conf vol						
vCu, unblocked vol	153				362	142
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	98				98	98
cM capacity (veh/h)	1427				625	905
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	192	153	33			
Volume Left	27	0	11			
Volume Right	0	22	22			
cSH	1427	1700	788			
Volume to Capacity	0.02	0.09	0.04			
Queue Length 95th (ft)	1	0	3			
Control Delay (s)	1.2	0.0	9.8			
Lane LOS	A	A	A			
Approach Delay (s)	1.2	0.0	9.8			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			30.3%			
Analysis Period (min)			15			

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
10: Daniels Street & Winters Drive
Existing Plus Project Conditions
PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	4	4	4	4	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	44	117	127	25	30	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	127	138	27	33	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC1, conflicting volume	165				374	152
vC2, stage 1 conf vol						
vCu, unblocked vol	165				374	152
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	97				95	96
cM capacity (veh/h)	1413				605	895
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	175	165	70			
Volume Left	48	0	33			
Volume Right	0	27	37			
cSH	1413	1700	731			
Volume to Capacity	0.03	0.10	0.10			
Queue Length 95th (ft)	3	0	8			
Control Delay (s)	2.3	0.0	10.4			
Lane LOS	A	A	B			
Approach Delay (s)	2.3	0.0	10.4			
Approach LOS	A	A	B			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			30.5%			
Analysis Period (min)			15			

Fehr & Peers Associates, Inc.

Synchro 6 Report

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Flt Sal'd (prot)	1770	1863	1583	1770	2406		1770	3460		1770	3460	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Sal'd Flow (pasm)	1770	1863	1583	1770	2406		1770	3460		1770	3460	
Volume (vph)	180	348	212	113	278	90	102	572	100	100	426	150
Peak-hour factor, PHF	ad. 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)	196	378	230	123	302	98	111	622	109	109	463	163
RTOR Reduction (vph)	0	0	170	0	0	41	0	17	0	0	40	0
Lane Group Flow (vph)	196	378	60	123	359	0	111	714	0	0	586	0
Turn Type	Prot	7	Perm	Prot	3	8	Prot	5	2	Prot	1	6
Protected Phases												
Permitted Phases		4			3			4			6	
Actuated Green, G (s)	9.1	18.4	18.4	5.8	15.1		6.9	23.9		6.3	23.3	
Effective Green, g (s)	9.1	18.4	18.4	5.8	15.1		6.9	23.9		6.3	23.3	
Actuated g/C Ratio	0.13	0.26	0.26	0.08	0.21		0.10	0.34		0.09	0.33	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	223	427	114	346	731		173	1175		158	1126	
v/s Ratio Prot	c0.11	c0.20		0.07	0.11		c0.06	c0.21		0.06	0.17	
v/s Ratio Perm			0.04									
v/c Ratio	0.86	0.78	0.15	0.84	0.49		0.64	0.61		0.69	0.52	
Uniform Delay, d1	30.0	24.1	20.0	31.8	24.3		30.6	19.4		31.1	19.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	7.6	0.2	33.4	9.5		7.3	2.3		11.5	3.0	
Delay (s)	55.5	31.7	20.1	65.2	24.8		38.4	21.7		43.0	20.8	
Level of Service	E	C	C	E	C		D	C		D	C	
Approach Delay (s)	34.2			34.3			23.9			24.0		
Approach LOS	C			C			C			C		
Intersection Summary												
HCM Average Control Delay	28.7			HCM Level of Service						C		
HCM Volume to Capacity ratio	0.68											
Actuated Cycle Length (s)	70.4			Sum of lost time (s)						12.0		
Intersection Capacity Utilization	62.4%			ICU Level of Service						B		
Analysis Period (min)	15											

Synchro 6 Report

	EPL	EFT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↔			←			↑			↓	
Ideal Flow (vphpl)	1800	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
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00	0.95		1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.91		1.00	0.97		1.00	1.00	0.85
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flt. Ratio (prot)	1.770	1.752		1.770	1.754		1.770	1.764		1.770	1.761	1.754
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1752		1770	1704		1770	1744		1770	1863	1583
Volume (vph)	45	95	63	85	95	125	93	669	155	155	466	708
Peak-hour factor, PHF Adj.	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)	49	103	68	92	103	136	101	727	168	168	507	768
RTOR Reduction (vph)	0	39	0	0	78	0	0	26	0	0	0	70
Turn Type	49	132	0	92	161	0	869	0	168	507	68	0
Protected Phases	Prot			Prot			Prot			Prot		Over
Permitted Phases	7	4		3	8		5	2		1		6
Actuated Green, G (s)	4.6	11.1		4.6	11.1		4.6	22.3		7.9	25.6	4.6
Effective Green, g (s)	4.6	11.1		4.6	11.1		4.6	22.3		7.9	25.6	4.6
Actuated g/C Ratio	0.07	0.18		0.07	0.18		0.07	0.36		0.13	0.41	0.07
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	132	314		132	306		132	1239		226	770	118
v/s Ratio Prot	0.03	0.08		c0.05	c0.09		0.06	0.25		c0.09	c0.27	0.00
v/s Ratio Perm												
w/c Ratio	0.37	0.42		0.70	0.53		0.77	0.70		0.74	0.66	0.05
Uniform Delay, d1	27.3	22.5		28.0	23.0		28.1	17.0		26.0	14.6	26.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.8	1.6		1.8	1.6		2.2	3.3		12.4	4.4	0.3
Delay (s)	28.0	23.4		42.8	24.7		50.9	20.3		38.4	19	26.8
Level of Service	C	C		D	C		D	C		B	B	C
Approach Delay (s)	24.7			28.7			23.4			24.1		C
Approach LOS	C						C					
Summary												
HCM Average Control Delay	24.7			HCM Level of Service						C		
HCM Volume to Capacity ratio	0.66											
Actuated Cycle Length (s)	61.9			Sum of lost time (s)						16.0		
Intersection Capacity Utilization	61.4%			ICU Level of Service						B		
Analysis Period (min)	15											

Synchro 6 Report

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	EBL	EBR	NBL	NBT	SBT	SBR
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	106	71	90	846	505	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	115	77	99	920	549	111
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1720	604	660			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1720	604	660			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
pQ queue free %	0	85	89			
cM capacity (veh/h)	88	498	928			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	192	1017	660			
Volume Left	115	98	0			
Volume Right	77	0	111			
cSH	131	928	1700			
Volume to Capacity	1.46	0.11	0.39			
Queue Length 95th (ft)	328	9	0			
Control Delay (s)	306.6	2.8	0.0			
Lane LOS	F	A				
Approach Delay (s)	306.6	2.8	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay		33.1				
Intersection Capacity Utilization		102.5%		ICU Level of Service		G
Analysis Period (min)		15				

Synchro 6 Report

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	15	0	342	34	594	0	0	426	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	16	0	372	37	646	0	0	463	163
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC1, conflicting volume	1636	1264	545	1264	1346	646	626			646		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCU, unblocked vol	1636	1264	545	1264	1346	646	626			646		
IC, single (s)	7.1	6.5	8.2	7.1	6.5	6.3	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
pQ queue free %	100	100	100	89	100	21	96			100		
cM capacity (veh/h)	17	163	539	142	145	472	956			940		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1								
Volume Total	388	37	646	626								
Volume Left	16	37	0	0								
Volume Right	372	0	0	163								
cSH	430	958	1700	1700								
Volume to Capacity	0.90	0.04	0.38	0.37								
Queue Length 95th (ft)	243	3	0	0								
Control Delay (s)	53.8	8.9	0.0	0.0								
Lane LOS	F	A										
Approach Delay (s)	53.8	0.5		0.0								
Approach LOS	F											
Intersection Summary												
Average Delay	12.5											
Intersection Capacity Utilization	66.9%											
Analysis Period (min)	15											
	ICU Level of Service								C			

Synbio 6 Report

Manteca
15: SR 120 EB Ramps & Union Road

Existing Plus Project Conditions

PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	455	0	60	0	0	0	0	173	5	257	184	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	495	0	65	0	0	0	0	188	5	279	200	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	949	952	200	1015	949	191	200			193		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	949	952	200	1015	949	191	200			193		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	92	100	100	100	100			80		
cM capacity (veh/h)	203	207	841	169	208	851	1372			1380		
Direction, Lane #	EB 1	NB 1	SB 1	SB 2								
Volume Total	560	193	279	200								
Volume Left	495	0	279	0								
Volume Right	65	5	0	0								
cSH	222	1700	1380	1700								
Volume to Capacity	2.52	0.11	0.20	0.12								
Queue Length 95th (ft)	1167	0	19	0								
Control Delay (s)	729.7	0.0	8.3	0.0								
Lane LOS	F		A									
Approach Delay (s)	729.7	0.0	4.8									
Approach LOS	F											
Intersection Summary												
Average Delay			333.3									
Intersection Capacity Utilization			66.9%				ICU Level of Service					C
Analysis Period (min)			15									

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
17: Woodward & Union Road

Existing Plus Project Conditions

PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (vph)	15	105	5	15	50	86	5	77	15	112	112	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	114	5	16	54	93	5	84	16	122	122	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol												
IC, single (s)												
IC, 2 stage (s)												
IF (s)												
p0 queue free %												
cM capacity (veh/h)												
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	136	164	105	265								
Volume Left	16	16	5	122								
Volume Right	5	93	16	22								
Hadj (s)	0.03	-0.29	-0.05	0.08								
Departure Headway (s)	5.1	4.8	5.0	4.9								
Degree Utilization, x	0.19	0.22	0.15	0.36								
Capacity (veh/h)	645	693	663	695								
Control Delay (s)	9.3	9.1	8.8	10.6								
Approach Delay (s)	9.3	9.1	8.8	10.6								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay				9.7								
ICU Level of Service				A								
Intersection Capacity Utilization				37.7%			ICU Level of Service					A
Analysis Period (min)				15								

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
18: Daniels Street & Lowe's Site Driveway 2

Existing Plus Project Conditions

PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EBT	EBR	WBL	WBT	NBL	NBR
Sign Control	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	208	27	0	98	59	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	226	29	0	107	64	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)	494					
pX, platoon unblocked						
vC, conflicting volume			255		294	128
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			255		294	128
IC, single (s)			4.1		6.8	6.9
IC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			100		90	96
cM capacity (veh/h)			1307		673	899
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	151	105	53	53	98	
Volume Left	0	0	0	0	64	
Volume Right	0	29	0	0	34	
cSH	1700	1700	1700	1700	737	
Volume to Capacity	0.08	0.05	0.03	0.03	0.13	
Queue Length 95th (ft)	0.0	0.0	0.0	0.0	11	
Control Delay (s)	0.0	0.0	0.0	0.0	10.6	
Lane LOS					B	
Approach Delay (s)	0.0		0.0		10.6	
Approach LOS					B	
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			18.4%			ICU Level of Service
Analysis Period (min)			15			A

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
19: Daniels Street & Lowe's Site Driveway 3

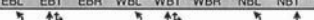
Existing Plus Project Conditions

PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EBT	EBR	WBL	WBT	NBL	NBR
Sign Control	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	228	11	13	98	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	248	12	14	107	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)	917					
pX, platoon unblocked						
vC, conflicting volume			260		329	124
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			260		329	124
IC, single (s)			4.1		6.8	6.9
IC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1302		633	904
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	124	124	12	14	53	53
Volume Left	0	0	0	14	0	0
Volume Right	0	0	12	0	0	0
cSH	1700	1700	1700	1302	1700	1700
Volume to Capacity	0.07	0.07	0.01	0.01	0.03	0.03
Queue Length 95th (ft)	0.0	0.0	0.0	1	0	0
Control Delay (s)	0.0	0.0	0.0	7.8	0.0	0.0
Lane LOS				A		
Approach Delay (s)	0.0			0.9		
Approach LOS						
Intersection Summary						
Average Delay				0.3		
Intersection Capacity Utilization				14.1%		ICU Level of Service
Analysis Period (min)				15		A

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca	Cumulative Conditions												
1: Yosemite Avenue & Airport Way													AM
													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
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		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00		
Flt Protected	1.00	0.93		1.00	0.95		1.00	1.00	0.85	1.00	0.98		
Satd. Flow (prot)	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00		
Flt Permitted	1.770	3295		1.770	3346		1.770	1863	1583	1.770	1820		
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	1.770	3295		1.770	3346		1.770	1863	1583	1.770	1820		
Volume (vph)	40	205	175	170	175	100	225	375	200	95	725	130	
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)	43	223	190	185	190	109	245	408	217	103	788	141	
RTOR Reduction (vph)	0	159	0	0	83	0	0	0	135	0	7	0	
Lane Group Flow (vph)	43	254	0	185	216	0	245	408	82	103	922	0	
Turn Type	Prot			Prot			Prot			Perm			
Protected Phases	7			3			5			2			
Permitted Phases	4			8			2			1			
Actuated Green, G (s)	4.5			10.4			8.0			28.8			
Effective Green, g (s)	4.5			10.4			8.0			28.8			
Actuated g/C Ratio	0.06			0.14			0.11			0.38			
Clearance Time (s)	4.0			4.0			4.0			4.0			
Vehicle Extension (s)	3.0			3.0			3.0			3.0			
Lane Grp Cap (vph)	105			243			187			707			
v/s Ratio Prot	0.02			c0.10			c0.14			0.22			
v/s Ratio Perm										0.05			
v/c Ratio	0.41			0.76			1.31			0.58			
Uniform Delay, d1	34.4			31.6			34.0			18.7			
Progression Factor	1.00			1.00			1.00			1.00			
Incremental Delay, d2	2.6			13.1			172.5			3.4			
Delay (s)	37.0			44.7			206.4			22.1			
Level of Service	D			D			F			C			
Approach Delay (s)	30.1			31.6			72.5			165.6			
Approach LOS	C			C			E			F			
Intersection Summary													
HCM Average Control Delay	32.5			HCM Level of Service			F						
HCM Volume to Capacity ratio	0.98												
Actuated Cycle Length (s)	75.9			Sum of lost time (s)			12.0						
Intersection Capacity Utilization	92.6%			ICU Level of Service			F						
Analysis Period (min)	15												
c Critical Lane Group													

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca		Cumulative Conditions																						
2: Wawona St. & Airport Way		AM																						
																								
Movement	WBL	WBR	NBT	NBR	SBL	SBT																		
Lane Configurations	1	1	1	1	1	1																		
Sign Control	Stop		Free			Free																		
Grade	0%		0%			0%																		
Volume (veh/h)	190	65	735	115	60	1010																		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92																		
Hourly flow rate (vph)	207	71	799	125	65	1098																		
Pedestrians																								
Lane Width (ft)																								
Walking Speed (ft/s)																								
Percent Blockage																								
Right turn lane (veh)																								
Median type	None																							
Median storage (veh)																								
Upstream signal (ft)	1313																							
pX, platoon unblocked	0.59	0.59				0.59																		
vC, conflicting volume	2030	861				924																		
vC1, stage 1 conf vol																								
vC2, stage 2 conf vol																								
vCu, unblocked vol	2834	767				872																		
IC, single (s)	6.4	6.2				4.1																		
IC, 2 stage (s)																								
IF (s)	3.5	3.3				2.2																		
p0 queue free %	0	70				86																		
cM capacity (veh/h)	10	239				460																		
Direction, Lane #																								
Volume Total	277	924	1163																					
Volume Left	207	0	65																					
Volume Right	71	125	0																					
cSH	13	1700	460																					
Volume to Capacity	21.27	0.54	0.14																					
Queue Length 95th (ft)	Err	0	12																					
Control Delay (s)	Err	0.0	6.1																					
Lane LOS	F	A																						
Approach Delay (s)	Err	0.0	6.1																					
Approach LOS	F																							
Intersection Summary																								
Average Delay	1175.3			ICU Level of Service			H																	
Intersection Capacity Utilization	123.4%																							
Analysis Period (min)	15																							

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca	
---------	--

Cumulative Conditions
AMFehr & Peers Associates, Inc. Synchro 6 ReportCumulative Conditions
AMFehr & Peers Associates, Inc. Synchro 6 ReportCumulative Conditions
AMFehr & Peers Associates, Inc. Synchro 6 ReportCumulative Conditions
AMFehr & Peers Associates, Inc. Synchro 6 Report

Manteca
8: Daniels Street & Fishback Road

Cumulative Conditions
AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑	↑	↓	↓
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	295	230	130	145	120	225
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	321	250	141	158	130	245
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)	645					
pX, platoon unblocked						
vC, conflicting volume	299				1111	220
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	299				1111	220
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	75				24	70
cM capacity (veh/h)	1262				172	820
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	571	299	130	245		
Volume Left	321	0	130	0		
Volume Right	0	158	0	245		
cSH	1262	1700	172	820		
Volume to Capacity	0.25	0.18	0.76	0.30		
Queue Length 95th (ft)	25	0	121	31		
Control Delay (s)	6.1	0.0	71.6	11.3		
Lane LOS	A		F	B		
Approach Delay (s)	6.1	0.0	32.2			
Approach LOS	D					
Intersection Summary						
Average Delay			12.5			
Intersection Capacity Utilization		60.8%		ICU Level of Service	B	
Analysis Period (min)		15				

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
9: Daniels Street & Junction Drive

Cumulative Conditions
AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑	↑	↓	↓
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	35	315	235	10	10	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	342	255	11	11	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	266				679	261
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	266				679	261
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				97	94
cM capacity (veh/h)	1298				405	778
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	380	266	54			
Volume Left	38	0	11			
Volume Right	0	11	43			
cSH	1298	1700	657			
Volume to Capacity	0.03	0.16	0.08			
Queue Length 95th (ft)	2	0	7			
Control Delay (s)	1.0	0.0	11.0			
Lane LOS	A		B			
Approach Delay (s)	1.0	0.0	11.0			
Approach LOS	B					
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		44.8%		ICU Level of Service	A	
Analysis Period (min)		15				

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
10: Daniels Street & Winters Drive

Cumulative Conditions
AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑	↑	↑	↓	↓
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	25	300	220	10	10	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	326	239	11	11	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	250				625	245
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	250				625	245
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	97
cM capacity (veh/h)	1316				439	794
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	353	250	38			
Volume Left	27	0	11			
Volume Right	0	11	27			
cSH	1316	1700	645			
Volume to Capacity	0.02	0.15	0.06			
Queue Length 95th (ft)	2	0	5			
Control Delay (s)	0.8	0.0	10.9			
Lane LOS	A		B			
Approach Delay (s)	0.8	0.0	10.9			
Approach LOS	B					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization		42.7%		ICU Level of Service	A	
Analysis Period (min)		15				

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
11: Yosemite Avenue & Union Road

Cumulative Conditions
AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt	1.00	1.00	0.95	1.00	0.96	1.00	0.98	1.00	0.98	1.00	0.96	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3382		1770	3463		1770	3409	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3382		1770	3463		1770	3409	
Volume (vph)	180	250	135	105	285	120	170	805	135	140	830	270
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)	196	272	147	114	310	130	185	875	147	152	902	293
RTOR Reduction (vph)	0	0	108	0	61	0	0	16	0	0	38	0
Lane Group Flow (vph)	196	272	39	114	379	0	185	1006	0	152	1157	0
Turn Type	Prot	Perm	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4	4	3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.5	19.5	19.5	6.2	14.2		9.8	22.3		8.7	21.2	
Effective Green, g (s)	11.5	19.5	19.5	6.2	14.2		9.8	22.3		8.7	21.2	
Actuated g/C Ratio	0.16	0.27	0.27	0.09	0.20		0.13	0.31		0.12	0.29	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	280	500	425	151	661		239	1062		212	994	
v/s Ratio Prot	c0.11	c0.15		0.05	0.11		c0.10	0.29		0.09	c0.34	
v/s Ratio Perm			0.02									
v/c Ratio	0.70	0.54	0.09	0.75	0.57		0.77	0.95		0.72	1.16	
Uniform Delay, d1	29.0	22.6	20.0	32.5	25.5		30.4	24.6		30.8	25.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.7	1.2	0.1	19.1	1.2		14.4	17.5		11.0	85.1	
Delay (s)	36.6	24.0	20.1	51.6	27.7		44.8	42.2		41.8	110.9	
Level of Service	D	C	C	D	C		D	D		D	F	
Approach Delay (s)	27.1			32.6			42.6			103.1		
Approach LOS	C			C			D			F		
Intersection Summary												
HCM Average Control Delay		60.4					HCM Level of Service			E		
HCM Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		72.7					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		76.0%					ICU Level of Service			D		
Analysis Period (min)		15										
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
13: Daniels Street & Union Road

						
Movement	EBL	EBR	NBL	NBT	SBT	SEB
Lane Configurations						
Sign Control	Stop			Free		
Grade	0%			0%		
Volume (veh/h)	210	205	155	835	1145	145
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	228	223	168	908	1245	158
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2568	1323	1402			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2568	1323	1402			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	65			
cM capacity (veh/h)	19	191	487			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	451	1076	1402			
Volume Left	228	168	0			
Volume Right	223	0	158			
cSH	34	487	1700			
Volume to Capacity	13.34	0.35	0.82			
Queue Length 95th (ft)	Err	38	0			
Control Delay (s)	Err	12.7	0.0			
Lane LOS	F	B				
Approach Delay (s)	Err	12.7	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay	1544.4					
Intersection Capacity Utilization	155.8%					
Analysis Period (min)	15					
	ICU Level of Service				H	

Manteca
15: SR 120 EB Ramps & Union Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	250	0	370	0	0	0	0	990	80	225	725	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	272	0	402	0	0	0	0	1076	87	245	788	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2397	2440	788	2799	2397	1120	788			1163		
vC1, stage 1 cont vol												
vC2, stage 2 cont vol												
vCu, unblocked vol	2397	2440	788	2799	2397	1120	788			1163		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	0	0	100	100	100			59		
cM capacity (veh/h)	16	19	391	0	20	251	831			601		
Direction, Lane #	EB 1	NB 1	SB 1	SB 2								
Volume Total	674	1163	245	788								
Volume Left	272	0	245	0								
Volume Right	402	87	0	0								
cSH	37	1700	601	1700								
Volume Io Capacity	18.22	0.68	0.41	0.46								
Queue Length 95th (ft)	Err	0	49	0								
Control Delay (s)	Err	0.0	15.0	0.0								
Lane LOS	F	C	C	C								
Approach Delay (s)	Err	0.0	3.6									
Approach LOS	F											
Intersection Summary												
Average Delay	2349.5											
Intersection Capacity Utilization	138.5%			ICU Level of Service			H					
Analysis Period (min)	15											

Manteca
16: Atherton Drive & Union Road

Cumulative Conditions

AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL			WBL			NBL			SBL		
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	170	200	10	30	220	340	10	560	50	480	345	290
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	185	217	11	33	239	370	11	609	54	500	375	315
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2679	2217	533	2310	2348	636	690			663		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vC3, unblocked vol	2679	2217	533	2310	2348	636	690			663		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	98	0	0	23	99			46		
cM capacity (veh/h)	0	20	547	0	16	478	904			926		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	413	641	674	1190								
Volume Left	185	33	11	500								
Volume Right	11	370	54	315								
cSH	0	0	904	926								
Volume to Capacity	Err	Err	0.01	0.54								
Queue Length 95th (ft)	Err	Err	1	83								
Control Delay (s)	Err	Err	0.3	12.7								
Lane LOS	F	F	A	B								
Approach Delay (s)	Err	Err	0.3	12.7								
Approach LOS	F	F										
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization	162.3%			ICU Level of Service			H					
Analysis Period (min)	15											

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
17: Woodward & Union Road

Cumulative Conditions

AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL			WBL			NBL			SBL		
Sign Control	Stop			Stop			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (vph)	25	155	10	40	180	75	110	520	105	40	305	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	168	11	43	196	82	120	565	114	43	332	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume												
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vC3, unblocked vol												
IC, single (s)												
IC, 2 stage (s)												
IF (s)												
p0 queue free %												
cM capacity (veh/h)												
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	207	321	799	418								
Volume Left	27	43	120	43								
Volume Right	11	62	114	43								
cSH	0.03	-0.09	-0.02	-0.01								
Departure Headway (s)	8.5	7.9	7.4	7.5								
Degree Utilization, x	0.49	0.70	1.64	0.87								
Capacity (veh/h)	385	427	489	461								
Control Delay (s)	19.5	27.6	318.2	43.5								
Approach Delay (s)	19.5	27.6	318.2	43.5								
Approach LOS	C	D	F	E								
Intersection Summary												
Average Delay				163.5								
HCM Level of Service				F								
Intersection Capacity Utilization	88.1%			ICU Level of Service			E					
Analysis Period (min)	15											

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
1: Yosemite Avenue & Airport Way

Cumulative Conditions

PM

																								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR												
Lane Configurations																								
Ideal Flow (vehpl)	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	1.00	0.95	1.00	0.95	1.00	0.94	1.00	1.00	1.00	1.00	1.00	1.00												
Frt	1.00	0.97	1.00	0.94	1.00	1.00	1.00	1.00	0.85	1.00	0.97	1.00												
Fit Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95												
Satd. Flow (prot)	1770	3438	1770	3335	1770	3335	1770	1863	1583	1770	1814	1814												
Fit Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95												
Satd. Flow (perm)	1770	3438	1770	3335	1770	3335	1770	1863	1583	1770	1814	1814												
Volume (vph)	230	660	155	135	280	175	95	830	280	205	680	145												
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)	250	717	168	147	304	190	103	902	304	223	739	158												
RTOR Reduction (vph)	0	25	0	0	125	0	0	0	101	0	9	0												
Lane Group Flow (vph)	250	860	0	147	369	0	103	902	203	223	888	0												
Turn Type	Prot			Prot			Prot		Perm	Prot														
Protected Phases	7	4		3	8		5	2		1	6													
Permitted Phases									2															
Actuated Green, G (s)	8.1	17.9		8.2	18.0		6.1	22.2	22.2	13.3	29.4													
Effective Green, g (s)	8.1	17.9		8.2	18.0		6.1	22.2	22.2	13.3	29.4													
Actuated g/C Ratio	0.10	0.23		0.11	0.23		0.08	0.29	0.29	0.17	0.38													
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0													
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0													
Lane Grp Cap (vph)	185	793		187	774		139	533	453	303	687													
v/s Ratio Prot	c0.14	c0.25		0.08	0.11		0.06	c0.48		c0.13	c0.49													
v/s Ratio Perm									0.13															
v/c Ratio	1.35	1.08		0.79	0.48		0.74	1.69	0.45	0.74	1.29													
Uniform Delay, d1	34.8	29.8		33.8	25.7		35.0	27.7	22.7	30.5	24.1													
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00													
Incremental Delay, d2	189.4	57.5		19.2	0.5		19.0	319.6	3.2	9.0	142.2													
Delay (s)	224.1	87.4		53.1	26.2		54.0	347.3	25.9	39.4	166.3													
Level of Service	F	F		D	C		D	F	C	D	F													
Approach Delay (s)		117.5			32.4			249.6			141.0													
Approach LOS		F			C			F			F													
Intersection Summary																								
HCM Average Control Delay	151.9			HCM Level of Service			F																	
HCM Volume to Capacity ratio	1.38																							
Actuated Cycle Length (s)	77.6			Sum of lost time (s)			20.0																	
Intersection Capacity Utilization	99.0%			ICU Level of Service			F																	
Analysis Period (min)	15																							
c. Critical Lane Group																								

Manteca
3: Daniels Street & Airport Way

Cumulative Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	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	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	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	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	450	275	690	475	75	90	545	670	440	80	30	650
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)	489	299	750	516	82	98	592	728	476	87	33	707
RTOR Reduction (vph)	0	0	165	0	0	74	0	0	242	0	0	0
Lane Group Flow (vph)	489	299	585	516	82	25	592	728	236	0	120	707
Turn Type	Prot	Perm	Prot	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	6.0	20.0	20.0	6.0	20.0	20.0	8.0	32.0	32.0	6.0	30.0	
Effective Green, g (s)	6.0	20.0	20.0	6.0	20.0	20.0	8.0	32.0	32.0	6.0	30.0	
Actuated g/C Ratio	0.08	0.25	0.25	0.08	0.25	0.25	0.10	0.40	0.40	0.08	0.38	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	257	466	396	133	466	396	177	745	633	93	699	
v/s Ratio Prot	0.14	0.16		c0.29	0.04		c0.33	c0.39			0.38	
v/s Ratio Perm			c0.37			0.02		0.15		0.10		
v/c Ratio	1.90	0.84	1.48	3.88	0.18	0.06	3.34	0.98	0.37	1.29	1.01	
Uniform Delay, d1	37.0	26.8	30.0	37.0	23.5	22.9	36.0	23.6	16.9	37.0	25.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	420.5	3.0	228.0	1313.8	0.2	0.1	1069.4	27.1	0.4	189.8	36.9	
Delay (s)	457.5	29.8	258.0	1350.8	23.7	22.9	1105.4	50.7	17.3	226.8	61.9	
Level of Service	F	C	F	F	C	C	F	D	B	F	E	
Approach Delay (s)	277.1			1007.5			389.1			71.1		
Approach LOS	F			F			F			E		
Intersection Summary												
HCM Average Control Delay	373.9											
HCM Volume to Capacity ratio	1.61											
Actuated Cycle Length (s)	80.0											
Intersection Capacity Utilization	118.5%											
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
3: Daniels Street & Airport Way

Cumulative Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	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	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	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	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	450	275	690	475	75	90	545	670	440	80	30	650
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)	489	299	750	516	82	98	592	728	476	87	33	707
RTOR Reduction (vph)	0	0	165	0	0	74	0	0	242	0	0	0
Lane Group Flow (vph)	489	299	585	516	82	25	592	728	236	0	120	707
Turn Type	Prot	Perm	Prot	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	6.0	20.0	20.0	6.0	20.0	20.0	8.0	32.0	32.0	6.0	30.0	
Effective Green, g (s)	6.0	20.0	20.0	6.0	20.0	20.0	8.0	32.0	32.0	6.0	30.0	
Actuated g/C Ratio	0.08	0.25	0.25	0.08	0.25	0.25	0.10	0.40	0.40	0.08	0.38	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	257	466	396	133	466	396	177	745	633	93	699	
v/s Ratio Prot	0.14	0.16		c0.29	0.04		c0.33	c0.39			0.38	
v/s Ratio Perm			c0.37			0.02		0.15		0.10		
v/c Ratio	1.90	0.84	1.48	3.88	0.18	0.06	3.34	0.98	0.37	1.29	1.01	
Uniform Delay, d1	37.0	26.8	30.0	37.0	23.5	22.9	36.0	23.6	16.9	37.0	25.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	420.5	3.0	228.0	1313.8	0.2	0.1	1069.4	27.1	0.4	189.8	36.9	
Delay (s)	457.5	29.8	258.0	1350.8	23.7	22.9	1105.4	50.7	17.3	226.8	61.9	
Level of Service	F	C	F	F	C	C	F	D	B	F	E	
Approach Delay (s)	277.1			1007.5			389.1			71.1		
Approach LOS	F			F			F			E		
Intersection Summary												
HCM Average Control Delay	373.9											
HCM Volume to Capacity ratio	1.61											
Actuated Cycle Length (s)	80.0											
Intersection Capacity Utilization	118.5%											
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
4: SR 120 WB & Airport Way

Cumulative Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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			
Lane Util. Factor					1.00	1.00	1.00	1.00	1.00			
Flt					0.91	1.00	1.00	1.00	0.96			
Fit Protected					0.98	0.95	1.00	1.00	1.00			
Satd. Flow (prot)					1669	1770	1863	1863	1783			
Fit Permitted					0.98	0.95	1.00	1.00	1.00			
Satd. Flow (perm)					1669	1770	1863	1863	1783			
Volume (vph)	0	0	0	210	0	400	630	1255	0	0	1240	575
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	228	0	435	685	1364	0	0	1348	625
RTOR Reduction (vph)	0	0	0	0	57	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	0	0	0	606	0	685	1364	0	0	1959	0
Turn Type	Split				Prot				6			
Protected Phases	8				5				2			
Permitted Phases												
Actuated Green, G (s)					16.0				23.0			
Effective Green, g (s)					16.0				23.0			
Actuated g/C Ratio					0.13				0.19			
Clearance Time (s)					4.0				4.0			
Vehicle Extension (s)					3.0				3.0			
Lane Grp Cap (vph)					223				339			
v/s Ratio Prot					c0.36				c0.39			
v/s Ratio Perm									0.73			
v/c Ratio					2.72				2.02			
Uniform Delay, d1					52.0				48.5			
Progression Factor					1.00				0.43			
Incremental Delay, d2					785.0				460.2			
Delay (s)					837.0				481.0			
Level of Service					F				B			
Approach Delay LOS	0.0				837.0				168.8			
Approach LOS	A								F			
Intersection Summary												
HCM Average Control Delay	377.2				HCM Level of Service				F			
HCM Volume to Capacity ratio	2.05											
Actuated Cycle Length (s)	120.0				Sum of lost time (s)				12.0			
Intersection Capacity Utilization	210.9%				ICU Level of Service				H			
Analysis Period (min)	15											
c Critical Lane Group												

[illegible][illegible]

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	345	400	295	155	150	345
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	375	435	321	168	163	375
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)		645				
pX, platform blocked					0.86	
vC, conflicting volume	489				1590	405
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
ICU, unblocked vol	489				1684	405
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
pO queue free %	65				0	42
cM capacity (veh/h)	1074				58	646
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	810	489	163	375		
Volume Left	375	0	163	0		
Volume Right	0	168	0	375		
cSH	1074	1700	58	646		
Volume to Capacity	0.35	0.29	2.80	0.58		
Queue Length 95th (ft)	40	0	419	84		
Control Delay (s)	7.2	0.0	965.9	18.0		
Lane LOS	A			F		C
Approach Delay (s)	7.2	0.0	305.2			
Approach LOS			F			
Intersection Summary						
Average Delay		92.6				
Intersection Capacity Utilization		83.4%		ICU Level of Service		E
Analysis Period (min)		15				

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4	1		1	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	30	520	420	10	20	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	565	457	11	22	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platform unblocked						
vC, conflicting volume	467				1092	462
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	467				1092	462
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
pM queue free %	97				91	95
cD capacity (veh/h)	1094				230	600
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	598	467	54			
Volume Left	33	0	22			
Volume Right	0	11	33			
cSH	1094	1700	365			
Volume to Capacity	0.03	0.27	0.15			
Queue Length 95th (ft)	2	0	13			
Control Delay (s)	0.8	0.0	16.6			
Lane LOS	A		C			
Approach Delay (s)	0.8	0.0	16.6			
Approach LOS	C		C			
Intersection Summary						
Average Delay		1.2				
Intersection Capacity Utilization		61.9%		ICU Level of Service		B
Analysis Period (min)		15				

Manteca
10: Daniels Street & Winters Drive

Cumulative Conditions
PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	30	510	405	10	30	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	554	440	11	33	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	451				1065	446
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	451				1065	446
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	97				86	96
cM capacity (veh/h)	1109				239	613
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	587	451	60			
Volume Left	33	0	33			
Volume Right	0	11	27			
cSH	1109	1700	331			
Volume to Capacity	0.03	0.27	0.18			
Queue Length 95th (ft)	2	0	16			
Control Delay (s)	0.8	0.0	18.3			
Lane LOS	A	C	C			
Approach Delay (s)	0.8	0.0	18.3			
Approach LOS	C					
Intersection Summary						
Average Delay		1.4				
Intersection Capacity Utilization		61.4%		ICU Level of Service	B	
Analysis Period (min)		15				

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
11: Yosemite Avenue & Union Road

Cumulative Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	285	220	210	1405	825	255						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92						
Hourly flow rate (vph)	310	239	228	1527	897	277						
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type				None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3019	1035	1174									
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3019	1035	1174									
IC, single (s)	6.4	6.2	4.1									
IC, 2 stage (s)												
IF (s)	3.5	3.3	2.2									
p0 queue free %	0	15	62									
cM capacity (veh/h)	9	281	595									
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	549	1755	1174									
Volume Left	310	228	0									
Volume Right	239	0	277									
cSH	16	595	1700									
Volume to Capacity	35.22	0.38	0.69									
Queue Length 95th (ft)	Err	45	0									
Control Delay (s)	Err	50.4	0.0									
Lane LOS	F	F	F									
Approach Delay (s)	Err	50.4	0.0									
Approach LOS	F											
Intersection Summary												
Average Delay		1603.4										
Intersection Capacity Utilization		183.7%		ICU Level of Service	H							
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
12: Wawona St. & Union Road

Cumulative Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	285	220	210	1405	825	255						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92						
Hourly flow rate (vph)	310	239	228	1527	897	277						
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type				None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3019	1035	1174									
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3019	1035	1174									
IC, single (s)	6.4	6.2	4.1									
IC, 2 stage (s)												
IF (s)	3.5	3.3	2.2									
p0 queue free %	0	15	62									
cM capacity (veh/h)	9	281	595									
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	549	1755	1174									
Volume Left	310	228	0									
Volume Right	239	0	277									
cSH	16	595	1700									
Volume to Capacity	35.22	0.38	0.69									
Queue Length 95th (ft)	Err	45	0									
Control Delay (s)	Err	50.4	0.0									
Lane LOS	F	F	F									
Approach Delay (s)	Err	50.4	0.0									
Approach LOS	F											
Intersection Summary												
HCM Average Control Delay		209.7		HCM Level of Service	F							
HCM Volume to Capacity ratio		1.19										
Actuated Cycle Length (s)		68.9		Sum of lost time (s)	12.0							
Intersection Capacity Utilization		103.2%		ICU Level of Service	G							
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
13: Daniels Street & Union Road

Cumulative Conditions
PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	285	220	210	1405	825	255						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92						
Hourly flow rate (vph)	310	239	228	1527	897	277						
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type				None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3019	1035	1174									
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3019	1035	1174									
IC, single (s)	6.4	6.2	4.1									
IC, 2 stage (s)												
IF (s)	3.5	3.3	2.2									
p0 queue free %	0	15	62									
cM capacity (veh/h)	9	281	595									
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	549	1755	1174									
Volume Left	310	228	0									
Volume Right	239	0	277									
cSH	16	595	1700									
Volume to Capacity	35.22	0.38	0.69									
Queue Length 95th (ft)	Err	45	0									
Control Delay (s)	Err	50.4	0.0									
Lane LOS	F	F	F									
Approach Delay (s)	Err	50.4	0.0									
Approach LOS	F											
Intersection Summary												
Average Delay		1603.4										
Intersection Capacity Utilization		183.7%		ICU Level of Service	H							
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca		Cumulative Conditions											
14: SR 120 WB Ramps & Union Road		PM											
													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Volume (veh/h)		0	0	0	125	0	350	455	1265	0	0	775	270
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	136	0	380	495	1375		0	0	842	293
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type		None			None								
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	3734	3353	989	3353	3500	1375	1136				1375		
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol													
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1		
IC, 2 stage (s)													
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2		
p0 queue free %	0	100	100	0	100	0	20				100		
cM capacity (veh/h)	0	2	299	2	1	178	615				499		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1									
Volume Total	516	495	1375	1136									
Volume Left	136	495	0	0									
Volume Right	380	0	0	293									
cSH	6	615	1700	1700									
Volume to Capacity	91.38	0.80	0.81	0.67									
Queue Length 95th (ft)	Err	201	0	0									
Control Delay (s)	Err	30.5	0.0	0.0									
Lane LOS	F	D											
Approach Delay (s)	Err	8.1		0.0									
Approach LOS	F												
Intersection Summary													
Average Delay	1470.2												
Intersection Capacity Utilization	171.4%												
Analysis Period (min)	15												
ICU Level of Service H													

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca												Cumulative Conditions			
15: SR 120 EB Ramps & Union Road												PM			
															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Sign Control	Stop														
Grade	0%														
Volume (veh/h)	735	0	670	0	0	0	0	985	215	265	635	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Hourly flow rate (vph)	799	0	728	0	0	0	0	1071	234	288	690	0			
Pedestrians															
Lane Width (ft)															
Walking Speed (ft/s)															
Percent Blockage															
Right turn flare (veh)															
Median type	None			None											
Median storage (veh)															
Upstream signal (ft)															
pX, platoon unblocked															
vC, conflicting volume	2454	2571	690	3182	2454	1188	690				1304				
vC1, stage 1 conf vol															
vC2, stage 2 conf vol															
vCu, unblocked vol	2454	2571	690	3182	2454	1188	690				1304				
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1				
IC, 2 stage (s)															
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2				
p0 queue free %	0	100	0	0	100	100	100				46				
cM capacity (veh/h)	12	12	445	0	14	229	904				531				
Direction, Lane #	EB 1	NB 1	SB 1	SB 2											
Volume Total	1527	1304	288	690											
Volume Left	799	0	288	0											
Volume Right	728	234	0	0											
cSH	22	1700	531	1700											
Volume to Capacity	68.09	0.77	0.54	0.41											
Queue Length 95th (ft)	Err	0	80	0											
Control Delay (s)	Err	0.0	19.5	0.0											
Lane LOS	F	C													
Approach Delay (s)	Err	0.0	5.8												
Approach LOS	F														
Intersection Summary															
Average Delay	4009.6														
Intersection on Capacity Utilization	171.4%													ICU Level of Service	H
Analysis Period (min)	15														

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca								Cumulative Conditions					
16: Atherton Drive & Union Road								PM					
													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	⬆			⬆			⬆			⬆			
Sign Control	Stop			Stop			Free			Free			
Grade	0%			0%			0%			0%			
Volume (veh/h)	450	310	20	60	280	500	10	250	40	480	455	370	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	489	337	22	65	304	543	11	272	43	522	495	402	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None			None									
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	2750	2076	696	2245	2255	293	897				315		
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol													
IC, single (s)	7.50	2076	6.6	6.2	7.1	6.5	6.2	4.1				315	
IC, 2 stage (s)													
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2		
pQ, queue free %	0	0	95	0	0	27	99				58		
cM capacity (veh/h)	0	31	442	0	24	746	757				1245		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	848	913	326	1418									
Volume Left	489	65	11	522									
Volume Right	22	543	43	402									
cSB	0	0	757	1245									
Volume to Capacity	Err	Err	0.01	0.42									
Queue Length 95th (ft)	Err	Err	1	53									
Control Delay (s)	Err	Err	0.5	9.2									
Lane LOS	F	F	A	A									
Approach Delay (s)	Err	Err	0.5	9.2									
Approach LOS	F	F											
Intersection Summary													
Average Delay	Err												
Intersection Capacity Utilization	193.7%				ICU Level of Service				H				
Analysis Period (min)	15												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Initial Flow (vph)	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	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93	1.00	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.98	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	3293	1770	3346	1770	3346	1770	1863	1583	1770	1821	1821
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95
Satd. Flow (perm)	1770	3293	1770	3346	1770	3346	1770	1863	1583	1770	1821	1821
Volume (vph)	40	205	178	179	175	100	228	384	207	95	735	130
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)	43	223	193	195	190	109	248	417	225	103	799	141
RTOR Reduction (vph)	0	161	0	0	82	0	0	0	140	0	739	0
Lane Group Flow (vph)	43	255	0	195	272	0	248	417	85	103	933	0
Turn Type	Prot						Prot		Perm	Prot		
Protected Phases	7	4		3	6		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	4.5	12.5		10.6	18.6		8.0	28.8	28.8	8.2	29.0	
Effective Green, g (s)	4.5	12.5		10.6	18.6		8.0	28.8	28.8	8.2	29.0	
Actuated g/C Ratio	0.06	0.16		0.14	0.24		0.11	0.38	0.38	0.11	0.38	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	105	541		247	810		196	705	599	191	684	
v/s Ratio Prot	0.02	c0.08		c0.11	0.06		c0.14	0.22		0.06	c0.51	
v/s Ratio Perm									0.05			
v/c Ratio	0.41	0.47		0.79	0.26		1.33	0.59	0.14	0.54	1.34	
Uniform Delay, d1	34.5	28.8		31.7	23.2		34.0	18.9	15.5	32.2	23.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	0.6		15.3	0.2		181.9	3.6	0.5	2.9	164.2	
Delay (s)	37.1	29.5		47.0	23.4		216.0	22.6	16.0	35.1	187.8	
Level of Service	D	C		D	C		F	C	B	D	F	
Approach Delay (s)		30.2			32.8			74.8			172.7	
Approach LOS		C			C			E			F	
Intersection Summary												
HCM Average Control Delay	95.9						HCM Level of Service			F		
ICM V/s to Capacity ratio	1.03											
Actuated Cycle Length (s)	76.1						Sum of lost time (s)			12.0		
Intersection Capacity Utilization	93.8%						ICU Level of Service			F		
Analysis Period (min)												
c Critical Lane Group												

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Sign Control	WBL	WBR	NBT	NBR	SBL	SBT
Grade	WBL	WBR	NBT	NBR	SBL	SBT
Volume (veh/h)	194	65	754	118	60	1032
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	211	71	820	128	65	1122
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)			1313			
pX, platoon unblocked	0.60	0.60			0.60	
vC, conflicting volume	2136	884			948	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2908	805			912	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	0	69			85	
cM capacity (veh/h)	9	228			445	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	282	948	1187			
Volume Left	211	0	65			
Volume Right	71	128	0			
cSH	12	1700	445			
Volume to Capacity	24.31	0.56	0.15			
Queue Length 95th (ft)	Err	0	13			
Control Delay (s)	Err	0.0	6.7			
Lane LOS	F		A			
Approach Delay (s)	Err	0.0	6.7			
Approach LOS	F					
Intersection Summary						
Average Delay		1168.3				
Intersection Capacity Utilization		124.7%		ICU Level of Service		H
Analysis Period (min)		15				

[illegible]

Movement	SBR
Lane Configurations	7
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Volume (vph)	185
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	201
RTOR Reduction (vph)	37
Lane Group Flow (vph)	164
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	30.1
Effective Green, g (s)	30.1
Actuated g/C Ratio	0.42
Clearance Time (s)	4.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	663
v/s Ratio Prot	
v/s Ratio Perm	0.10
v/c Ratio	0.25
Uniform Delay, d1	13.6
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	13.8
Level of Service	B
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Manteca
4: SR 120 WB & Airport Way

Cumulative Plus Project Conditions

AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	0	0	0	435	0	731	715	1131	0	0	745	557
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	473	0	795	777	1229	0	0	810	605
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												494
pX, platoon unblocked	0.59	0.59	0.59	0.59	0.59		0.59					
vC1, conflicting volume	4691	3896	1112	3896	4199	1229	1415			1229		
vC2, stage 1 conf vol												
vCu, unblocked vol	7262	5914	1191	5914	6428	1229	1705			1229		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	100	0	0	0	0			100		
cM capacity (veh/h)	0	0	135	0	0	217	220			567		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1								
Volume Total	1267	777	1229	1415								
Volume Left	473	777	0	0								
Volume Right	795	0	0	605								
cSH	0	220	1700	1700								
Volume to Capacity	Err	3.54	0.72	0.83								
Queue Length 95th (ft)	Err	Err	0	0								
Control Delay (s)	Err	1185.8	0.0	0.0								
Lane LOS	F	F										
Approach Delay (s)	Err	459.3		0.0								
Approach LOS	F											
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization		191.9%		ICU Level of Service			H					
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
5: SR 120 EB & Airport Way

Cumulative Plus Project Conditions

AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	526	0	410	0	0	0	1320	180	313	867	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	572	0	446	0	0	0	1435	196	340	942	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC1, conflicting volume	3155	3253	942	3601	3155	1533	942			1630		
vC2, stage 1 conf vol												
vCu, unblocked vol	3155	3253	942	3601	3155	1533	942			1630		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	0	0	100	100	100			15		
cM capacity (veh/h)	2	1	319	0	2	143	728			398		
Direction, Lane #	EB 1	NB 1	SB 1	SB 2								
Volume Total	1017	1630	340	942								
Volume Left	572	0	340	0								
Volume Right	446	196	0	0								
cSH	3	1700	398	1700								
Volume to Capacity	321.66	0.96	0.85	0.55								
Queue Length 95th (ft)	Err	0	206	0								
Control Delay (s)	Err	0.0	48.8	0.0								
Lane LOS	F		F									
Approach Delay (s)	Err	0.0	12.9									
Approach LOS	F											
Intersection Summary												
Average Delay			2592.5									
Intersection Capacity Utilization		191.9%		ICU Level of Service			H					
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
6: Atherton Rd. & Airport Way

Cumulative Plus Project Conditions

AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	420	95	10	70	55	438	20	642	45	447	746	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	457	103	11	76	60	476	22	698	49	486	811	91
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC1, conflicting volume	3030	2573	811	2586	2615	698	902			747		
vC2, stage 1 conf vol												
vCu, unblocked vol	3030	2573	811	2586	2615	698	902			747		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	97	0	0	0	97			44		
cM capacity (veh/h)	0	11	379	0	10	441	753			862		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	457	103	11	76	60	476	22	698	49	486	811	91
Volume Left	457	0	0	76	0	0	22	0	0	486	0	0
Volume Right	0	0	11	0	0	476	0	0	49	0	0	91
cSH	0	11	379	0	10	441	753	1700	1700	862	1700	1700
Volume to Capacity	Err	9.44	0.03	Err	5.82	1.08	0.03	0.41	0.03	0.56	0.48	0.05
Queue Length 95th (ft)	Err	Err	2	Err	Err	394	2	0	0	90	0	0
Control Delay (s)	Err	Err	14.8	Err	Err	96.9	9.9	0.0	0.0	14.4	0.0	0.0
Lane LOS	F	F	B	F	F	F	A			B		
Approach Delay (s)	Err			Err			0.3			5.1		
Approach LOS	F			F								
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization		98.5%		ICU Level of Service			F					
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
7: Woodward & Airport Way

Cumulative Plus Project Conditions

AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (vph)	148	190	65	20	105	82	130	477	80	31	187	608
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	161	207	71	22	114	89	141	518	87	34	203	661
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	438	225	747	898								
Volume Left (vph)	161	22	141	34								
Volume Right (vph)	71	89	87	661								
Had (s)	0.01	-0.18	0.00	-0.40								
Departure Headway (s)	8.5	9.4	8.5	8.1								
Degree Utilization, x	1.03	0.59	1.76	2.02								
Capacity (veh/h)	427	374	429	452								
Control Delay (s)	82.8	24.8	373.2	485.1								
Approach Delay (s)	82.8	24.8	373.2	485.1								
Approach LOS	F	C	F	F								
Intersection Summary												
Delay			327.6									
HCM Level of Service			F									
Intersection Capacity Utilization		132.3%		ICU Level of Service			H					
Analysis Period (min)		15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca 8: Daniels Street & Lowe's Site Driveway													Cumulative Plus Project Conditions AM
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
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		
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		1.00	1.00		
Friction	1.00	0.94		1.00	0.93		1.00	0.86		1.00	0.85		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1770	3341		1770	1723		1770	1593		1770	1586		
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1770	3341		1770	1723		1770	1593		1770	1586		
Volume (vph)	255	255	153	33	146	145	143	1	27	120	2	225	
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)	321	278	166	36	159	158	155	1	29	130	2	245	
RTOR Reduction (vph)	0	104	0	0	46	0	0	25	0	0	203	0	
Lane Group Flow (vph)	321	340	0	36	271	0	155	5	0	130	44	0	
Turn Type	Prot			Prot			Prot			Prot			
Protected Phases	5	2		1	6		7	4		3	8		
Permitted Phases													
Actuated Green, G (s)	12.3	18.9		6.9	13.5		7.4	9.2		8.5	10.3		
Effective Green, g (s)	12.3	18.9		6.9	13.5		7.4	9.2		8.5	10.3		
Actuated g/C Ratio	0.21	0.32		0.12	0.23		0.12	0.15		0.14	0.17		
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	366	1061		205	391		220	246		253	275		
v/s Ratio Prot	c0.18	0.10		0.02	c0.16		c0.09	0.00		0.07	c0.03		
v/s Ratio Perm													
v/c Ratio	0.88	0.32		0.18	0.69		0.70	0.02		0.51	0.16		
Uniform Delay, d1	22.9	15.4		23.7	21.1		25.0	21.3		23.6	20.9		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	20.3	0.2		0.4	5.2		9.8	0.0		1.8	0.3		
Delay (s)	43.2	15.6		24.1	26.3		34.8	21.4		25.3	21.2		
Level of Service	D	B		C	C		C	C		C	C		
Approach Delay (s)	27.2			26.1			32.6			22.6			
Approach LOS	C			C			C			C			
Intersection Summary													
HCM Average Control Delay		26.5					HCM Level of Service			C			
HCM Volume to Capacity ratio		0.57											
Actuated Cycle Length (s)		59.5					Sum of lost time (s)			12.0			
Intersection Capacity Utilization		68.2%					ICU Level of Service			C			
Analysis Period (min)		15											
c Critical Lane Group													

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca 9: Daniels Street & Junction Drive													Cumulative Plus Project Conditions AM
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Sign Control	Free	Free	Stop										
Grade	0%	0%	0%										
Volume (veh/h)	36	344	276	10	10	42							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92							
Hourly flow rate (vph)	39	374	300	11	11	46							
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type										None			
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	311									758	305		
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	311									758	305		
tC, single (s)	4.1									6.4	6.2		
tC, 2 stage (s)													
tF (s)	2.2									3.5	3.3		
p0 queue free %	97									97	94		
cM capacity (veh/h)	1250									363	734		
Direction, Lane #	EB 1	WB 1	SB 1										
Volume Total	413	311	57										
Volume Left	39	0	11										
Volume Right	0	11	46										
cSH	1250	1700	614										
Volume to Capacity	0.03	0.18	0.09										
Queue Length 95th (ft)	2	0	8										
Control Delay (s)	1.0	0.0	11.5										
Lane LOS	A	B											
Approach Delay (s)	1.0	0.0	11.5										
Approach LOS		B											
Intersection Summary													
Average Delay		1.4											
Intersection Capacity Utilization		48.6%					ICU Level of Service			A			
Analysis Period (min)		15											

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca 10: Daniels Street & Winters Drive													Cumulative Plus Project Conditions AM
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Sign Control	Free	Free	Stop										
Grade	0%	0%	0%										
Volume (veh/h)	28	326	257	10	10	29							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92							
Hourly flow rate (vph)	30	354	279	11	11	32							
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type										None			
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	290						700	285					
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	290						700	285					
tC, single (s)	4.1						6.4	6.2					
tC, 2 stage (s)													
tF (s)	2.2						3.5	3.3					
p0 queue free %	98						97	96					
cM capacity (veh/h)	1272						396	754					
Direction, Lane #	EB 1	WB 1	SB 1										
Volume Total	385	290	42										
Volume Left	30	0	11										
Volume Right	0	11	32										
cSH	1272	1700	612										
Volume to Capacity	0.02	0.17	0.07										
Queue Length 95th (ft)	2	0	6										
Control Delay (s)	0.8	0.0	11.3										
Lane LOS	A	B											
Approach Delay (s)	0.8	0.0	11.3										
Approach LOS		B											
Intersection Summary													
Average Delay		1.1											
Intersection Capacity Utilization		46.2%					ICU Level of Service			A			
Analysis Period (min)		15											

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca						Cumulative Plus Project Conditions							AM
11: Yosemite Avenue & Union Road													
													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
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		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95		
Friction	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	0.96		
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1770	1863	1583	1770	3383		1770	3461		1770	3410		
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1770	1863	1583	1770	3383		1770	3461		1770	3410		
Volume (vph)	180	251	138	112	287	120	172	812	141	140	838	270	
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)	196	273	150	122	312	130	187	883	153	152	911	293	
RTOR Reduction (vph)	0	0	0	110	0	51	0	0	17	0	37	0	
Lane Group Flow (vph)	196	273	40	122	381	0	187	1019	0	152	1167	0	
Type	Prot	7	4	Perm	Prot	3	8	Prot	5	2	Prot	1	6
Protected Phases													
Permitted Phases				4									
Actuated Green, G (s)	11.5	19.6	19.6	6.2	14.3		9.8	22.3		8.7	21.2		
Effective Green, g (s)	11.5	19.6	19.6	6.2	14.3		9.8	22.3		8.7	21.2		
Actuated g/C Ratio	0.16	0.27	0.27	0.09	0.20		0.13	0.31		0.12	0.29		
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	280	502	426	151	665	238	1060	212	993	293	993		
vs Ratio Perm	c0.11	c0.15	0.03	0.07	0.11	c0.11	0.29	0.09	0.34	0.09	0.34		
u/c Ratio	0.70	0.54	0.09	0.81	0.57		0.79	0.96		0.72	1.18		
Incremental Delay, d1	29.0	22.8	19.9	32.7	26.5		30.5	24.8		30.9	25.8		
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	7.7	1.2	0.1	26.2	1.2		15.6	1.98		11.0	89.6		
Delay (s)	36.7	24.0	20.0	58.9	27.7		46.1	44.6		41.8	115.4		
Level of Service	D	C	C	E	C		D	D		D	F		
Approach Delay (s)	27.0				34.4			44.9			107.2		
Approach LOS	C				C			D			F		
Intersection Summary													
HCM Average Control Delay	62.8					HCM Level of Service					E		
HCM Volume to Capacity ratio	0.82												
Actuated Cycle Length (s)	72.8					Sum of lost time (s)					12.0		
Intersection Capacity Utilization	76.4%					ICU Level of Service					D		
Analysis Period (min)	15												
c. Critical Lane Group													

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1692		1770	1692		1770	3487		1770	1693	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1694		1770	1692		1770	3487		1770	1683	1583
Volume (vph)	115	115	177	230	95	150	96	860	94	155	893	40
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
Aadj. Flow (vph)	125	125	192	250	103	163	104	935	102	168	971	43
RTOR Reduction (vph)	0	88	0	0	91	0	0	11	0	0	0	24
Flow Conversion (vph)	125	229	0	250	175	0	104	1026	0	168	971	19
Turn Type	Prot			Pct			Prot			Prot		Over T
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.0	13.0		6.0	13.0		4.7	21.1		8.0	24.4	6.0
Effective Green, g (s)	6.0	13.0		6.0	13.0		4.7	21.1		8.0	24.4	6.0
Accumulated %C Ratio	0.09	0.20		0.09	0.20		0.07	0.33		0.12	0.38	0.09
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	166	344		166	343		130	1148		221	709	148
v/c Ratio Prot	0.07	c0.13		c0.14	0.10		0.06	0.29		c0.09	c0.52	0.01
v/c Ratio Perm												
v/c Ratio	0.75	0.66		1.51	0.51		0.80	0.89		0.76	1.37	0.13
Uniform Delay, d1	28.3	23.5		29.0	22.7		29.2	20.4		27.1	19.8	26.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental delay, d2	17.4	4.0		28.9	1.3		28.0	10.7		14.2	17.5	2.0
Delay (s)	45.8	28.3		285.4	24.0		57.8	31.2		41.4	195.1	27.0
Level of Service	D	C		F	C		E	C		D	F	C
Approach Delay (s)		33.2			150.7			33.6			167.1	
Approach LOS		C			F			C			F	
Intersection Summary												
HCM Average Control Delay	100.1						HCM Level of Service			F		
HCM Volume to Capacity ratio	1.16											
Actuated Cycle Length (s)	64.1									16.0		
Intersection Capacity Utilization	95.3%						ICU Level of Service			F		
Analysis Period (min)	15											
g. Critical Lane Group												

Manteca Cumulative Plus Project Conditions
13: Daniels Street & Union Road AM

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free 0%	Free 0%	
Grade	0%			0%	0%	
Volume (veh/h)	237	210	160	835	1145	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	258	228	174	908	1245	192
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pK, platoon unblocked						
vC, conflicting volume	2596	1341	1437			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCU, unblocked vol	2596	1341	1437			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	63			
cM capacity (veh/h)	17	186	472			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	486	1082	1437			
Volume Left	258	174	0			
Volume Right	228	0	192			
cSH	30	472	1700			
Volume to Capacity	16.05	0.37	0.85			
Queue Length 95th (ft)	Err	42	0			
Control Delay (s)	Err	14.0	0.0			
Lane LOS	F	B				
Approach Delay (s)	Err	14.0	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay		1622.1				
Intersection Capacity Utilization		159.8%		ICU Level of Service		H
Analysis Period (min)		15				

Manteca Cumulative Plus Project Conditions
14: SR 120 WB Ramps & Union Road AM

Movement	EBL	EBT	EBR	WBL	WBt	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control							Stop				Free	
Grade							0%				0%	
Volume (veh/h)							0				0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.80	0.92
Hourly flow rate (vph)	0	0	0	168	0	265	573	797	0	0	870	603
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked vol												
vC1, conflicting volume vC1, stage 1 conf vol	3398	3114	1171	3114	3415	797	1473	797				
vC2, stage 2 conf vol vC2, unblocked vol	3398	3114	1171	3114	3415	797	1473	797				
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
pM queue free %	0	0	100	0	0	26	0	100				
cM capacity (veh/h)	0	0	234	0	0	387	458	825				
Direction, Lane #	WB 1	NB 1	NB 2	SB 1								
Volume Total	453	573	797	1473								
Volume Left	168	573	0									
Volume Right	285	0	0	603								
cSH	0	458	1700	1700								
Volume to Capacity	Err	1.25	0.47	0.87								
Queue Length 95th (ft)	Err	589	0									
Control Delay (s)	Err	156.9	0.0	0.0								
Lane LOS	F	F										
Approach Delay (s)	Err	65.6	0.0									
Approach LOS	F											
Intersection Summary												
Average Delay	Err											
Intersection Capacity Utilization	139.9%				ICU Level of Service				H			
Analysis Period (min)	15											

Manteca Cumulative Plus Project Conditions
15: SR 120 EB Ramps & Union Road AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔						↑			↑	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	250	0	384	0	0	0	0	1010	80	227	728	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly low rate (vph)	272	0	417	0	0	0	0	1098	87	247	791	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)								752				
pX, platoon unblocked	0.70	0.70		0.70	0.70	0.70				0.70		
vC, conflicting volume	2426	2470	791	2843	2426	1141	791			1185		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3049	3112	791	3649	3049	1203	791			1256		
IC, single (s)	7.1	6.5	3.3	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.2	3.5	4.0	3.3	2.2			2.2		
p0 queue free (%)	0	100	0	0	100	100	100			35		
cM capacity (veh/h)	3	3	389	0	3	156	829			382		
Direction, Lane #	EB 1	NB 1	SB 1	SB 2								
Volume Total	689	1185	247	791								
Volume Left	272	0	247	0								
Volume Right	417	87	0	0								
cSH	7	1700	362	1700								
Volume to Capacity	105.96	0.70	0.65	0.47								
Queue Length 95th (ft)	Err	0	109	0								
Control Delay (s)	Err	0.0	30.0	0.0								
Lane LOS	F	D	D	D								
Approach Delay (s)	Err	0.0	7.1									
Approach LOS	F											
Intersection Summary												
Average Delay	2358.9											
Intersection Capacity Utilization	139.9%											
Analysis Period (min)	15											
	ICU Level of Service								H			

Cumulative Plus Project Conditions
AMFehr & Peers Associates, Inc.Cumulative Plus Project Conditions
AMFehr & Peers Associates, IncCumulative Plus Project Conditions
AMFehr & Peers Associates, Inc.Cumulative Plus Project Conditions
AMFehr & Peers Associates, Inc.

Manteca 1: Yosemite Avenue & Airport Way							Cumulative Plus Project Conditions PM						
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
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	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	
Flt	1.00	0.97	1.00	0.94	1.00	0.94	1.00	1.00	0.85	1.00	0.97	1.00	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	3435	1770	3335	1770	3335	1770	1863	1583	1770	1815	1815	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	3435	1770	3335	1770	3335	1770	1863	1583	1770	1815	1815	
Volume (vph)	230	660	161	153	280	175	102	851	299	205	700	145	
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)	250	717	175	166	304	190	111	925	325	223	761	158	
RTOR Reduction (vph)	0	27	0	0	123	0	0	0	107	0	9	0	
Lane Group Flow (vph)	250	865	0	166	371	0	111	925	218	223	910	0	
Turn Type	Prot			Prot			Prot			Perm			
Protected Phases	7 4			3 8			5 2			1 6			
Permitted Phases							2						
Actuated Green, G (s)	8.0 17.1			10.3 19.4			6.2 21.8 21.8			13.5 29.1			
Effective Green, g (s)	8.0 17.1			10.3 19.4			6.2 21.8 21.8			13.5 29.1			
Actuated g/C Ratio	0.10 0.22			0.13 0.25			0.08 0.28 0.28			0.17 0.37			
Clearance Time (s)	4.0 4.0			4.0 4.0			4.0 4.0 4.0			4.0 4.0			
Vehicle Extension (s)	3.0 3.0			3.0 3.0			3.0 3.0 3.0			3.0 3.0			
Lane Grp Cap (vph)	180 746			232 822			139 516 438			304 671			
v/s Ratio Prot	c0.14 c0.25			0.09 0.11			0.06 c0.50			c0.13 c0.50			
v/s Ratio Perm							0.14						
v/c Ratio	1.39 1.16			0.72 0.45			0.80 1.79 0.50			0.73 1.36			
Uniform Delay, d1	35.4 30.8			32.8 25.1			35.6 28.4 23.9			30.9 24.8			
Progression Factor	1.00 1.00			1.00 1.00			1.00 1.00 1.00			1.00 1.00			
Incremental Delay, d2	205.4 86.6			10.0 0.4			26.5 364.4 4.0			8.8 170.0			
Delay (s)	240.8 117.4			42.8 25.5			62.1 392.9 27.9			39.7 194.8			
Level of Service	F F			D C			E F			C D			
Approach Delay (s)	144.4			29.9			278.7			164.5			
Approach LOS	F			C			F			F			
Intersection Summary													
HCM Average Control Delay	174.6						HCM Level of Service						F
HCM Volume to Capacity ratio	1.40												
Actuated Cycle Length (s)	78.7						Sum of lost time (s)						20.0
Intersection Capacity Utilization	101.3%						ICU Level of Service						G
Analysis Period (min)	15												
c Critical Lane Group													

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca 2: Wawona St. & Airport Way							Cumulative Plus Project Conditions PM		
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations	↔	↔	↔	↔	↔	↔			
Sign Control	Stop		Free			Free			
Grade	0%		0%			0%			
Volume (veh/h)	112	55	1197	227	105	909			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92			
Hourly flow rate (vph)	122	60	1301	247	114	988			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type	None								
Median storage (veh)									
Upstream signal (ft)	1313								
pX, platoon unblocked	0.63	0.63			0.63				
vC, conflicting volume	2641	1424			1548				
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	3608	1675			1871				
tC, single (s)	6.4	6.2			4.1				
tC, 2 stage (s)									
tF (s)	3.5	3.3			2.2				
p0 queue free %	0	19			44				
cM capacity (veh/h)	2	74			202				
Direction, Lane #	WB 1	NB 1	SB 1						
Volume Total	182	1548	1102						
Volume Left	122	0	114						
Volume Right	60	247	0						
cSH	2	1700	202						
Volume to Capacity	75.28	0.91	0.56						
Queue Length 95th (ft)	Err	0	76						
Control Delay (s)	Err	0.0	57.3						
Lane LOS	F		F						
Approach Delay (s)	Err	0.0	57.3						
Approach LOS	F		F						
Intersection Summary									
Average Delay	663.3								
Intersection Capacity Utilization	150.0%			ICU Level of Service			H		
Analysis Period (min)	15								

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca 3: Daniels Street & Airport Way							Cumulative Plus Project Conditions PM						
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	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	1.00	
Satd Flow (prot)	3433	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1863	
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	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1863	
Volume (vph)	450	291	690	726	92	152	545	662	682	80	89	642	
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)	489	316	750	789	100	165	592	720	741	87	97	698	
RTOR Reduction (vph)	0	0	0	266	0	0	63	0	0	253	0	0	
Lane Group Flow (vph)	489	316	484	789	100	102	592	720	488	0	184	698	
Turn Type	Prot	Prot	Perm	Prot	Prot	Perm	Prot	Perm	custom	Prot	Prot	Prot	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases			4			8			2	1			
Actuated Green, G (s)	39.3	25.0	25.0	27.0	12.7	12.7	21.0	46.0	46.0	6.0	31.0		
Effective Green, g (s)	39	25.0	25.0	27.0	12.7	12.7	21.0	46.0	46.0	6.0	31.0		
Actuated g/C Ratio	0.33	0.21	0.21	0.22	0.11	0.11	0.18	0.38	0.38	0.05	0.26		
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Group Cap (vph)	1124	388	330	398	197	168	310	714	607	62	481		
v/s Ratio Prot	0.14	0.17		0.45	0.05	0.06	0.33	0.39	0.31		0.37		
v/s Ratio Perm			0.31							0.15			
v/c Ratio	0.44	0.81	1.47	1.98	0.51	0.60	1.91	1.01	0.80	2.97	1.45		
Unit Delay, d1	31.6	45.3	47.5	46.5	50.7	51.2	49.5	37.0	33.0	57.0	44.5		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.93	0.90	0.79	1.00	1.00		
Incremental Delay, d2	0.3	12.3	225.9	451.0	2.1	6.0	410.4	12.2	1.1	927.3	214.4		
Delay (s)	31.9	57.6	273.4	497.5	52.7	57.3	456.5	45.6	27.0	984.3	258.9		
Level of Service	C	E	F	F	D	D	E	F	D	C	F		
Approach Delay (s)		153.6			386.4			157.4			334.4		
Approach LOS		F			F			F			F		
Intersection Summary													
HCM Average Control Delay	232.2				HCM Level of Service				F				
HCM Volume to Capacity ratio	1.75												
Actuated Cycle Length (s)	120.0				Sum of lost time (s)				16.0				
Intersection Capacity Utilization	132.9%				ICU Level of Service				H				
Analysis Period (min)	15												
c. Critical Lane Group													

Manteca 4: SR 120 WB & Airport Way													Cumulative Plus Project Conditions PM	
↖ ↗ ↘ ↙ ↠ ↡ ↢ ↣ ↤ ↥ ↦ ↧ ↨														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Ideal Flow (vphpl)	1900	1900	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	
Lane Util. Factor	1.00			1.00			1.00			1.00			0.96	
Frnt	0.91			1.00			1.00			1.00			1.00	
Fit Protected	0.99			0.95			1.00			1.00			1.00	
Satd. Flow (prot)	1662			1770			1863			1782			1782	
Fit Permitted	0.99			0.95			1.00			1.00			1.00	
Satd. Flow (perm)	1662			1770			1863			1782			1782	
Volume (vph)	0	0	0	210	0	492	630	1397	0	0	1394	664	664	664
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	0.92	0.92
Adj. Flow (vph)	0	0	0	228	0	535	685	1518	0	0	1515	722	722	722
RTOR Reduction (vph)	0	0	0	0	46	0	0	0	0	0	15	0	15	0
Lane Group Flow (vph)	0	0	0	0	717	0	685	1518	0	0	2223	0	0	0
Turn Type				Split			Prot			Prot				
Protected Phases				8			5			2			6	
Permitted Phases														
Actuated Green, G (s)				28.0			18.0			84.0			62.0	
Effective Green, g (s)				28.0			18.0			84.0			62.0	
Actuated g/C Ratio				0.23			0.15			0.70			0.52	
Clearance Time (s)				4.0			4.0			4.0			4.0	
Vehicle Extension (s)				3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)				388			266			1304			921	
v/s Ratio Prot				c0.43			c0.39			0.81			c1.25	
v/s Ratio Perm														
v/c Ratio				1.85			2.58			1.16			2.41	
Uniform Delay, d1				46.0			51.0			18.0			29.0	
Progression Factor				1.00			0.58			0.77			0.76	
Incremental Delay, d2				391.4			709.8			74.7			636.2	
Delay (s)				437.4			739.6			88.6			658.2	
Level of Service				F			F			F			F	
Approach Delay (s)	0.0			437.4			F			291.0			658.2	
Approach LOS	A			F			F			F			F	
Intersection Summary														
HCM Average Control Delay	470.4			HCM Level of Service			F							
HCM Volume to Capacity ratio	2.30													
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			12.0			H				
Intersection Capacity Utilization	224.9%			ICU Level of Service										
Analysis Period (min)	15													
c Critical Lane Group														

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca 5: SR 120 EB & Airport Way													Cumulative Plus Project Conditions PM		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
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				
Lane Util. Factor		1.00						1.00		1.00	1.00				
Fr		0.93						0.97		1.00	1.00				
Flt Protected		0.98						1.00		0.95	1.00				
Satd. Flow (prot)		1691						1800		1770	1863				
Flt Permitted		0.98						1.00		0.13	1.00				
Satd. Flow (perm)		1691						1800		246	1863				
Volume (vph)	743	0	805	0	0	0	0	1284	425	558	1046	0			
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	0.92	0.92	
Adj. Flow (vph)	808	0	875	0	0	0	0	1396	462	607	1137	0			
RTOR Reduction (vph)	0	27	0	0	0	0	0	0	10	0	0	0			
Lane Group Flow (vph)	0	1656	0	0	0	0	0	1848	0	607	1137	0			
Turn Type	Perm												Perm		
Protected Phases	4												2	6	
Permitted Phases	4												6		
Actuated Green, G (s)	53.0												59.0	59.0	
Effective Green, g (s)	53.0												59.0	59.0	
Actuated g/C Ratio	0.44												0.49	0.49	
Clearance Time (s)	4.0												4.0	4.0	
Vehicle Extension (s)	3.0												3.0	3.0	
Lane Grp Cap (vph)	747												885	916	
v/s Ratio Prot													1.03	0.61	
v/s Ratio Perm	0.98													c2.46	
v/c Ratio	2.22												2.09	5.02	
Uniform Delay, d1	33.5												30.5	30.5	
Progression Factor	1.00												1.00	0.26	
Incremental Delay, d2	551.7												493.4	1809.1	
Delay (s)	585.2												523.9	1816.9	
Level of Service	F												F	F	
Approach Delay (s)	585.2														716.4
Approach LOS	F												A	F	F
Intersection Summary															
HCM Average Control Delay	607.0												HCM Level of Service		F
HCM Volume to Capacity ratio	3.69														
Actuated Cycle Length (s)	120.0												Sum of lost time (s)		8.0
Intersection Capacity Utilization	224.9%												ICU Level of Service		H
Analysis Period (min)	15														
c. Critical Lane Group															

Manteca	Cumulative Plus Project Conditions												PM
8: Daniels Street & Lowe's Site Driveway													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Ideal Flow (vphpl)	1900	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
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flt	1.00	0.95		1.00	0.95		1.00	0.86		1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		0.95
Satd. Flow (prot)	1770	3360		1770	1778		1770	1598		1770	1586		1770
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		0.95
Satd. Flow (perm)	1770	3360		1770	1778		1770	1598		1770	1586		1770
Volume (vph)	345	475	242	50	356	155	269	3	51	150	3	345	345
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	0.92
Adj. Flow (vph)	375	516	263	54	387	168	292	3	55	163	3	375	375
RTOR Reduction (vph)	0	70	0	0	18	0	0	47	0	0	309	0	0
Lane Group Flow (vph)	375	709	0	54	537	0	292	11	0	163	69	0	0
Turn Type	Prot			Prot			Prot			Prot			
Protected Phases	5	2		1	6		7	4		3	8		
Permitted Phases													
Actuated Green, G (s)	12.0	24.7		7.5	20.2		10.0	9.4		9.5	8.9		
Effective Green, g (s)	12.0	24.7		7.5	20.2		10.0	9.4		9.5	8.9		
Actuated g/C Ratio	0.18	0.37		0.11	0.30		0.15	0.14		0.14	0.13		
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	317	1237		198	535		264	224		251	210		
v/s Ratio Prot	c0.21	0.21		0.03	c0.30		c0.17	0.01		0.09	c0.04		
v/s Ratio Perm													
v/c Ratio	1.18	0.57		0.27	1.00		1.11	0.05		0.65	0.33		
Uniform Delay, d1	27.6	17.0		27.3	23.4		28.6	25.0		27.2	26.4		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	109.9	0.6		0.7	39.8		86.8	0.1		5.7	0.9		
Delay (s)	137.4	17.6		28.0	63.2		115.4	25.1		32.9	27.3		
Level of Service	F	B		C	E		F	C		C	C		
Approach Delay (s)	56.5			60.1			100.4			29.0			
Approach LOS	E			E			F			C			
Intersection Summary													
HCM Average Control Delay	57.5			HCM Level of Service			E						
HCM Volume to Capacity ratio	0.95												
Actuated Cycle Length (s)	67.1			Sum of lost time (s)			16.0						
Intersection Capacity Utilization	97.0%			ICU Level of Service			F						
Analysis Period (min)	15												
c Critical Lane Group													

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca		Cumulative Plus Project Conditions												PM	
9: Daniels Street & Junction Drive															
															
Movement	EBL	EBT	WBT	WBR	SBL	SBR									
Lane Configurations															
Sign Control		Free	Free		Stop										
Grade		0%	0%		0%										
Volume (veh/h)	32	576	498	10	20	32									
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92									
Hourly flow rate (vph)	35	626	541	11	22	35									
Pedestrians															
Lane Width (ft)															
Walking Speed (ft/s)															
Percent Blockage															
Right turn flare (veh)															
Median type	None														
Median storage (veh)															
Upstream signal (ft)															
pX, platoon unblocked															
vC, conflicting volume	552					1242	547								
vC1, stage 1 conf vol															
vC2, stage 2 conf vol															
vCu, unblocked vol	552					1242	547								
IC, single (s)	4.1					6.4	6.2								
IC, 2 stage (s)															
IF (s)	2.2					3.5	3.3								
p0 queue free %	97					88	94								
cM capacity (veh/h)	1018					186	537								
Direction, Lane #	EB 1	WB 1	SB 1												
Volume Total	661	552	57												
Volume Left	35	0	22												
Volume Right	0	11	35												
cSH	1018	1700	311												
Volume to Capacity	0.03	0.32	0.18												
Queue Length 95th (ft)	3	0	16												
Control Delay (s)	0.9	0.0	19.1												
Lane LOS	A		C												
Approach Delay (s)	0.9	0.0	19.1												
Approach LOS			C												
Intersection Summary															
Average Delay	1.3														
Intersection Capacity Utilization	66.4%			ICU Level of Service			C								
Analysis Period (min)	15														

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca		Cumulative Plus Project Conditions												PM		
10: Daniels Street & Winters Drive																
Movement	EBL	EBT	WBT	WBR	SBL	SBR										
Lane Configurations		↕	↕		↕											
Sign Control		Free	Free		Stop											
Grade		0%	0%		0%											
Volume (veh/h)		38	568	475	10	30	33									
Peak Hour Factor		0.92	0.92	0.92	0.92	0.92	0.92									
Hourly flow rate (vph)		41	617	516	11	33	36									
Pedestrians																
Lane Width (ft)																
Walking Speed (ft/s)																
Percent Blockage																
Right turn flare (veh)																
Median type					None											
Median storage (veh)																
Upstream signal (ft)																
pX, platoon unblocked																
vC, conflicting volume	527				1222	522										
vC1, stage 1 conf vol																
vC2, stage 2 conf vol																
vCu, unblocked vol	527				1222	522										
IC, single (s)	4.1				6.4	6.2										
IC, 2 stage (s)																
IF (s)	2.2				3.5	3.3										
p0 queue free %	96				83	94										
cM capacity (veh/h)	1040				191	555										
Direction, Lane #	EB 1	WB 1	SB 1													
Volume Total	659	527	68													
Volume Left	41	0	33													
Volume Right	0	11	36													
cSH	1040	1700	290													
Volume to Capacity	0.04	0.31	0.24													
Queue Length 95th (ft)	3	0	22													
Control Delay (s)	1.0	0.0	21.2													
Lane LOS	A		C													
Approach Delay (s)	1.0	0.0	21.2													
Approach LOS			C													
Intersection Summary																
Average Delay	1.7															
Intersection Capacity Utilization	71.3%			ICU Level of Service	C											
Analysis Period (min)	15															

Manteca
12: Wavona St. & Union Road

Cumulative Plus Project Conditions													
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
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	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.91		1.00	0.98		1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1770	1772		1770	1696		1770	1696		1770	1696	1583	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	1770	1772		1770	1696		1770	1696		1770	1696	1583	
Volume (vph)	105	205	98	140	185	275	158	1286	250	275	589	160	
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)	114	223	107	152	201	299	172	1398	272	299	666	174	
RTOR Reduction (vph)	0	25	0	0	78	0	0	23	0	0	0	101	
Lane Group Flow (vph)	114	305	0	152	422	0	172	1647	0	299	966	73	
Turn Type	Prot			Prot			Prot			Prot		Over	
Protected Phases	7	4		3	8		5	2		1	6	7	
Permitted Phases													
Actuated Green, G (s)	6.0	18.9		6.0	18.9		6.0	20.0		8.0	22.0	6.0	
Effective Green, g (s)	6.0	18.9		6.0	18.9		6.0	20.0		8.0	22.0	6.0	
Actuated g/C Ratio	0.09	0.27		0.09	0.27		0.09	0.29		0.12	0.32	0.09	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	154	486		154	465		154	1002		206	595	138	
v/s Ratio Prot	0.06	0.17		c0.09	c0.25		0.10	0.48		c0.17	c0.52	0.05	
v/s Ratio Perm													
v/c Ratio	0.74	0.63		0.99	0.91		1.12	1.64		1.45	1.62	0.53	
Uniform Delay, d1	30.7	21.9		31.4	24.2		31.4	24.5		30.4	23.5	30.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	17.3	2.5		68.0	21.3		107.3	294.3		228.2	288.3	3.6	
Delay (s)	48.0	24.4		99.4	45.4		138.8	318.8		258.6	311.7	33.7	
Level of Service	D	C		F	D		F	F		F	F	C	
Approach Delay (s)		30.5			58.0			302.0			267.1		
Approach LOS		C			E			F			F		
Intersection Summary													
HCM Average Control Delay				226.6			HCM Level of Service			F			
HCM Volume to Capacity ratio				1.23									
Actuated Cycle Length (s)				68.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization				104.5%			ICU Level of Service			G			
Analysis Period (min)													
c Critical Lane Group													

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
13: Daniels Street & Union Road

Cumulative Plus Project Conditions															
PM															
Movement	EBL	EBR	NBL	NBT	SBT	SBR									
Lane Configurations	↔	↔	↔	↔	↔	↔									
Sign Control	Stop			Free	Free										
Grade	0%			0%	0%										
Volume (veh/h)	348	232	220	1405	825	315									
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92									
Hourly flow rate (vph)	378	252	239	1527	897	342									
Pedestrians															
Lane Width (ft)															
Walking Speed (ft/s)															
Percent Blockage															
Right turn flare (veh)															
Median type	None														
Median storage (veh)															
Upstream signal (ft)															
pX, platoon unblocked															
vC, conflicting volume	3073	1068	1239												
vC1, stage 1 conf vol															
vC2, stage 2 conf vol															
vCu, unblocked vol	3073	1068	1239												
tC, single (s)	6.4	6.2	4.1												
tC, 2 stage (s)															
tF (s)	3.5	3.3	2.2												
p0 queue free %	0	6	57												
cM capacity (veh/h)	8	269	562												
Direction, Lane #	EB 1	NB 1	SB 1												
Volume Total	630	1766	1239												
Volume Left	378	239	0												
Volume Right	252	0	342												
cSH	13	562	1700												
Volume to Capacity	49.81	0.43	0.73												
Queue Length 95th (ft)	Err	53	0												
Control Delay (s)	Err	60.3	0.0												
Lane LOS	F	F													
Approach Delay (s)	Err	60.3	0.0												
Approach LOS	F														
Intersection Summary															
Average Delay				1763.1											
Intersection Capacity Utilization				192.2%			ICU Level of Service			H					
Analysis Period (min)				15											

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca
14: SR 120 WB Ramps & Union Road

Cumulative

Manteca		Cumulative Plus Project Conditions											
16: Atherton & Union Road		PM											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Volume (veh/h)	450	310	20	60	280	523	10	266	40	504	473	370	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	489	337	22	65	304	568	11	289	43	548	514	402	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type													
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	2864	2165	715	2334	2345	311	916			333			
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	2864	2165	715	2334	2345	311	916			333			
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1			
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2			
p0 queue free %	0	0	95	0	0	22	99			55			
cM capacity (veh/h)	0	26	431	0	20	729	744			1227			
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	848	938	343	1464									
Volume Left	489	65	11	548									
Volume Right	22	568	43	402									
cSH	0	0	744	1227									
Volume to Capacity	Err	Err	0.01	0.45									
Queue Length 95th (ft)	Err	Err	1	59									
Control Delay (s)	Err	Err	0.5	10.1									
Lane LOS	F	F	A	B									
Approach Delay (s)	Err	Err	0.5	10.1									
Approach LOS	F	F											
Intersection Summary													
Average Delay			Err										
Intersection Capacity Utilization			198.2%			ICU Level of Service			H				
Analysis Period (min)			15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca		Cumulative Plus Project Conditions											
17: Woodward & Union Road		PM											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Volume (vph)	55	525	55	175	380	86	55	175	115	102	321	130	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	60	571	60	190	413	93	60	190	125	111	349	141	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type													
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume													
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol													
tC, single (s)													
tC, 2 stage (s)													
tF (s)													
p0 queue free %													
cM capacity (veh/h)													
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	690	697	375	601									
Volume Left	60	190	60	111									
Volume Right	60	93	125	141									
Had (s)	0.00	0.01	-0.13	-0.07									
Departure Headway (s)	9.5	9.5	9.4	9.5									
Degree Utilization, x	1.83	1.84	0.98	1.58									
Capacity (veh/h)	383	383	375	384									
Control Delay (s)	403.9	412.3	73.2	296.3									
Approach Delay (s)	403.9	412.3	73.2	296.3									
Approach LOS	F	F	F	F									
Intersection Summary													
Delay			326.5										
HCM Level of Service			F										
Intersection Capacity Utilization			121.7%			ICU Level of Service			H				
Analysis Period (min)			15										

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca		Cumulative Plus Project Conditions											
18: Daniels Street & Lowe's Site Driveway 2		PM											
Movement	EBT	EBR	WBL	WBT	WBR	NBL	NBR						
Lane Configurations	EBT	EBR	WBL	WBT	WBR	NBL	NBR						
Sign Control	Free	Free	Free	Free	Free	Free	Free						
Grade	0%	0%	0%	0%	0%	0%	0%						
Volume (veh/h)	599	77	32	498	63	12							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92							
Hourly flow rate (vph)	651	84	35	541	68	13							
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type													
Median storage (veh)													
Upstream signal (ft)	494												
pX, platoon unblocked													
vC, conflicting volume													
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol													
tC, single (s)													
tC, 2 stage (s)													
tF (s)													
p0 queue free %													
cM capacity (veh/h)													
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1							
Volume Total	434	301	35	271	271	82							
Volume Left	0	0	35	0	0	68							
Volume Right	0	84	0	0	0	13							
cSH	1700	1700	875	1700	1700	255							
Volume to Capacity	0.26	0.18	0.04	0.16	0.16	0.32							
Queue Length 95th (ft)	0	0	3	0	0	33							
Control Delay (s)	0.0	0.0	9.3	0.0	0.0	25.6							
Lane LOS			A			D							
Approach Delay (s)	0.0		0.6			25.6							
Approach LOS						D							
Intersection Summary													
Average Delay			1.7										
Intersection Capacity Utilization			38.6%			ICU Level of Service			A				
Analysis Period (min)			15										

Fehr & Peers Associates, Inc.

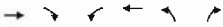
Synchro 6 Report

Manteca

19: Daniels Street & Lowe's Site Driveway 3

Cumulative Plus Project Conditions

PM



Movement	EBT	EBR	WBL	WBT	WBR	NBL	NBR
Lane Configurations	↑↑	↑		↑↑			↑
Sign Control	Free			Free		Stop	
Grade	0%			0%		0%	
Volume (veh/h)	602	9	0	530	0	6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	654	10	0	576	0	7	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type					None		
Median storage (veh)							
Upstream signal (ft)	917						
pX, platoon unblocked							
vC, conflicting volume			664		942	327	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			664		942	327	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	99	
cM capacity (veh/h)			921		261	669	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	
Volume Total	327	327	10	288	288	7	
Volume Left	0	0	0	0	0	0	
Volume Right	0	0	10	0	0	7	
cSH	1700	1700	1700	1700	1700	669	
Volume to Capacity	0.19	0.19	0.01	0.17	0.17	0.01	
Queue Length 95th (ft)	0	0	0	0	0	1	
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.4	
Lane LOS						B	
Approach Delay (s)	0.0			0.0		10.4	
Approach LOS						B	
Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			26.6%		ICU Level of Service		A
Analysis Period (min)			15				

Manteca Lowes
1: Yosemite Avenue & Airport Way

Cumulative Plus Project With Mitigation

AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Friction	1.00	1.00	0.85	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3346	1770	3353	1770	3460	1770	3460	1770
Fit Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3346	1770	3353	1770	3460	1770	3460	1770
Volume (vph)	40	205	178	179	175	100	228	384	207	95	735	130
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)	43	223	193	195	190	109	248	417	225	103	799	141
RTOR Reduction (vph)	0	0	159	0	84	0	0	68	0	0	15	0
Lane Group Flow (vph)	43	223	34	195	215	0	248	574	0	103	925	0
Turn Type	Prot	Prot	Perm	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	4.9	13.5	13.5	9.1	17.7		9.1	31.3		7.7	29.9	
Effective Green, g (s)	4.9	13.5	13.5	9.1	17.7		9.1	31.3		7.7	29.9	
Actuated g/C Ratio	0.06	0.17	0.17	0.12	0.23		0.12	0.40		0.10	0.39	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	112	616	275	208	763		208	1352		176	1333	
v/s Ratio Prot	0.02	c0.06		c0.11	0.06		c0.14	0.17		0.06	c0.27	
v/s Ratio Perm			0.02									
v/c Ratio	0.38	0.36	0.12	0.94	0.28		1.19	0.42		0.59	0.69	
Uniform Delay, d1	34.9	28.3	27.0	34.0	24.7		34.2	16.7		33.4	20.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	0.4	0.2	44.6	0.2		124.0	1.0		4.9	3.0	
Delay (s)	37.1	28.6	27.2	78.6	24.9		158.2	17.6		38.3	23.0	
Level of Service	D	C	C	E	C		B	C		D	C	
Approach Delay (s)	28.8			46.1			56.8			24.5		
Approach LOS	C			D			E			C		
Intersection Summary												
HCM Average Control Delay	38.9											
HCM Volume to Capacity ratio	0.73											
Actuated Cycle Length (s)	77.6								16.0			
Intersection Capacity Utilization	66.0%								C			
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
2: Wawona Street & Airport Way

Cumulative Plus Project With Mitigation

AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.95
Friction	0.97	0.98	1.00	0.98	1.00	0.98
Fit Protected	0.96	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1735	3468	1770	3539	1770	3539
Fit Permitted	0.96	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1735	3468	1770	3539	1770	3539
Volume (vph)	194	65	754	118	60	1032
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	211	71	820	128	65	1122
RTOR Reduction (vph)	18	0	17	0	0	0
Lane Group Flow (vph)	284	0	931	0	65	1122
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	12.6		25.2		3.2	32.4
Effective Green, g (s)	12.6		25.2		3.2	32.4
Actuated g/C Ratio	0.24		0.46		0.06	0.61
Clearance Time (s)	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	412		1649		107	2163
v/s Ratio Prot	c0.15		0.27		0.04	c0.32
v/s Ratio Perm						
v/c Ratio	0.64		0.56		0.61	0.52
Uniform Delay, d1	18.2		10.0		24.3	5.9
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	3.4		0.4		9.4	0.2
Delay (s)	21.5		10.4		33.7	6.1
Level of Service	C		B		C	A
Approach Delay (s)	21.5		10.4		7.6	
Approach LOS	C		B		A	
Intersection Summary						
HCM Average Control Delay	10.3					
HCM Volume to Capacity ratio	0.55					
Actuated Cycle Length (s)	53.0					8.0
Intersection Capacity Utilization	52.7%					A
Analysis Period (min)	15					
c Critical Lane Group						

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
3: Daniels Street & Airport Way

Cumulative Plus Project With Mitigation

AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.95	1.00	0.95	1.00
Friction	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3433	1863	1583	3433	1863	1583	3433	3539	1583	1770	3539	1770
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3433	1863	1583	3433	1863	1583	3433	3539	1583	1770	3539	1770
Volume (vph)	40	63	140	311	147	56	575	771	516	65	125	861
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)	43	68	152	338	160	61	625	838	561	71	136	925
RTOR Reduction (vph)	0	0	9	0	0	0	51	0	0	228	0	0
Lane Group Flow (vph)	43	68	143	338	160	10	625	838	333	0	207	925
Turn Type	Prot	Prot	pm+ov	Prot	Prot	Prot	pm+ov	pm+ov	Prot	Prot	Prot	Prot
Protected Phases	7	4	5	3	8		5	2	3	1	1	6
Permitted Phases			4			8			2			
Actuated Green, G (s)	5.9	13.1	39.2	12.5	19.7	19.7	26.1	55.7	68.2	17.7	47.3	
Effective Green, g (s)	5.9	13.1	39.2	12.5	19.7	19.7	26.1	55.7	68.2	17.7	47.3	
Actuated g/C Ratio	0.05	0.11	0.34	0.11	0.17	0.17	0.23	0.48	0.59	0.15	0.41	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	176	212	595	373	319	271	779	1714	994	272	1456	
v/s Ratio Prot	0.01	0.04	0.05	c0.10	c0.09		c0.18	0.24	0.04	0.12	c0.26	
v/s Ratio Perm			0.04			0.01			0.17			
v/c Ratio	0.24	0.32	0.24	0.91	0.50	0.04	0.80	0.49	0.33	0.76	0.64	
Uniform Delay, d1	52.4	46.9	27.2	50.7	43.2	39.7	42.0	20.0	11.9	46.6	27.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.20	1.40	1.00	1.00	
Incremental Delay, d2	0.7	0.9	0.2	24.7	1.2	0.1	5.2	0.9	0.2	11.8	2.1	
Delay (s)	53.1	47.7	27.4	75.4	44.4	39.8	48.6	24.8	16.8	58.6	29.1	
Level of Service	D	D	C	E	D	D	D	C	B	E	C	
Approach Delay (s)	36.9			62.6			28.9			32.1		
Approach LOS	D			E			C			C		
Intersection Summary												
HCM Average Control Delay	35.4											
HCM Volume to Capacity ratio	0.68											
Actuated Cycle Length (s)	115.0											
Intersection Capacity Utilization	65.5%											
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
3: Daniels Street & Airport Way

Cumulative Plus Project With Mitigation

AM Peak Hour

Movement	SBR
Lane Configurations	↖
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Volume (vph)	185
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	201
RTOR Reduction (vph)	45
Lane Group Flow (vph)	156
Turn Type	pm+ov
Protected Phases	7
Permitted Phases	6
Actuated Green, G (s)	53.2
Effective Green, g (s)	53.2
Actuated g/C Ratio	0.46
Clearance Time (s)	4.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	787
v/s Ratio Prot	0.01
v/s Ratio Perm	0.09
v/c Ratio	0.20
Uniform Delay, d1	18.3
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	18.4
Level of Service	B
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Manteca Lowes
4: SR 120 WB & Airport Way

Cumulative Plus Project With Mitigation

AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SbL	SbT	SBR
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	0.95	0.97	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Frt	1.00	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00	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	1.00	1.00	1.00
Satd. Flow (prot)	3433	1504	1504	3433	5085	5085	3433	5085	5085	3433	5085	5085
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	3433	1504	1504	3433	5085	5085	3433	5085	5085	3433	5085	5085
Volume (vph)	0	0	0	435	0	731	715	1131	0	0	745	557
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	473	0	795	777	1229	0	0	810	605
RTOR Reduction (vph)	0	0	0	0	75	75	0	0	0	0	0	408
Lane Group Flow (vph)	0	0	0	473	322	323	777	1229	0	0	810	197
Turn Type	Split			Perm			Prot			Perm		
Protected Phases	8			8			5			2		
Permitted Phases	8			8			5			2		
Actuated Green, G (s)	35.1			35.1			41.0			71.9		
Effective Green, g (s)	35.1			35.1			41.0			71.9		
Actuated g/C Ratio	0.31			0.31			0.36			0.63		
Clearance Time (s)	4.0			4.0			4.0			4.0		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	1048			459			1224			3179		
v/s Ratio Prot	0.14			0.21			0.23			0.24		
v/s Ratio Perm	0.45			0.70			0.63			0.39		
v/c Ratio	0.45			0.70			0.63			0.39		
Uniform Delay, d1	32.2			35.3			35.3			30.8		
Progression Factor	1.00			1.00			1.00			0.49		
Incremental Delay, d2	0.3			4.8			4.9			1.6		
Delay (s)	32.5			40.1			40.2			16.6		
Level of Service	C			D			B			A		
Approach Delay (s)	0.0			37.3			8.2			50.4		
Approach LOS	A			D			A			D		
Intersection Summary												
HCM Average Control Delay	28.8			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.67											
Actuated Cycle Length (s)	115.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	80.0%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
5: SR 120 EB & Airport Way

Cumulative Plus Project With Mitigation

AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	0.88					0.91	1.00	0.97	0.91	
Flt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1681	2787					5085	1583	3433	5085	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1681	2787					5085	1583	3433	5085	
Volume (vph)	526	0	410	0	0	0	0	1320	180	313	867	0
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)	572	0	446	0	0	0	0	1435	186	340	942	0
RTOR Reduction (vph)	0	0	167	0	0	0	0	0	58	0	0	0
Lane Group Flow (vph)	286	286	279	0	0	0	0	1435	138	340	942	0
Turn Type	Prot			Perm			Perm			Prot		
Protected Phases	7			4			2			1		
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	38.1			38.1			43.5			21.4		
Effective Green, g (s)	38.1			38.1			43.5			21.4		
Actuated g/C Ratio	0.33			0.33			0.38			0.19		
Clearance Time (s)	4.0			4.0			4.0			4.0		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	557			557			923			1923		
v/s Ratio Prot	0.17			0.17			0.28			0.10		
v/s Ratio Perm				0.17						0.09		
v/c Ratio	0.51			0.51			0.75			0.23		
Uniform Delay, d1	31.0			31.0			28.6			31.0		
Progression Factor	1.00			1.00			1.00			0.74		
Incremental Delay, d2	0.8			0.8			0.2			1.9		
Delay (s)	31.8			31.8			28.8			24.6		
Level of Service	C			C			B			B		
Approach Delay (s)	30.5			0.0			23.8			6.8		
Approach LOS	C			A			C			A		
Intersection Summary												
HCM Average Control Delay	20.0			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.62											
Actuated Cycle Length (s)	115.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	80.0%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
6: Atherton Road & Airport Way

Cumulative Plus Project With Mitigation

AM Peak Hour

Northbound Road & Airport Way												
	←		←		←		←		←		←	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.97	0.91	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Flow (prot)	3433	1863	1583	1770	1863	1583	1770	5035	3433	5085	1583	3433
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Satd. Flow (perm)	3433	1863	1583	1770	1863	1583	1770	5035	3433	5085	1583	3433
Volume (vph)	420	95	10	70	55	438	20	642	45	447	746	84
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)	457	103	11	76	60	476	22	698	49	486	811	91
RTOR Reduction (vph)	0	0	0	9	0	402	0	5	0	0	0	36
Adj. Group Flow (vph)	457	103	2	76	60	74	22	742	0	486	811	55
Turn Type	Prot		Perm	Prot		Perm	Prot		Prot		Perm	
Protected Phases	3			3		8		2			6	
Permitted Phases			4			8						7
Actuated Green, G (s)	13.0	17.9	17.9	7.7	12.6	12.6	3.4	52.1	21.3	70.0	70.0	6.0
Effective Green, g (s)	13.0	17.9	17.9	7.7	12.6	12.6	3.4	52.1	21.3	70.0	70.0	6.0
Actuated g/C Ratio	0.11	0.16	0.16	0.07	0.11	0.11	0.03	0.45	0.19	0.61	0.61	0.07
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	38.8	246	119	204	204	153	52	2281	636	3095	966	146
v/s Ratio Perm	c0.13	0.06	0.04	0.04	0.03	0.05	0.01	c0.15	c0.14	0.16	0.04	0.03
v/s Ratio	1.18	0.36	0.01	0.64	0.29	0.43	0.42	0.33	0.76	0.26	0.96	0.06
Unitic Delay, d1	51.0	43.4	41.0	52.3	47.1	47.8	54.8	20.2	44.5	10.5	9.1	9.1
Incremental Delay	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	1.16	1.64	1.00
Progression Factor	103.7	0.8	0.0	10.7	0.8	1.7	5.5	0.4	5.2	0.2	0.1	0.8
Delay (s)	154.7	44.1	41.0	63.0	47.9	49.6	80.3	20.6	46.2	12.3	15.1	15.1
Level of Service	F	D	D	E	D	D	E	C	D	B	B	C
Approach Delay	132.6				51.1		21.7				24.4	
Approach LOS	F				D		C				C	
Intersection Summary												
HCM Average Control Delay	47.1		HCM Level of Service						D			
HCM Volume to Capacity ratio	0.54											
Actuated Cycle Length (s)	115.0		Sum of lost time (s)						16.0			
Intersection Capacity Utilization	62.5%		ICU Level of Service						B			
Analysis Period (min)	15											
c. Critical Lane Group												

Manteca Lowes
8: Daniels Street & Fishback Road

Cumulative Plus Project With Mitigation
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.93		1.00	0.86		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3341		1770	1723		1770	1593		1770	1586	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3341		1770	1723		1770	1593		1770	1586	
Volume (vph)	295	256	153	33	146	145	143	1	27	120	2	225
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)	321	278	166	36	159	158	155	1	29	130	2	245
RTOR Reduction (vph)	0	79	0	0	37	0	0	25	0	0	216	0
Lane Group Flow (vph)	321	365	0	36	280	0	155	5	0	130	31	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7 4			3 8			5 2			1 6		
Permitted Phases												
Actuated Green, G (s)	17.2	33.9		2.4	19.1		8.8	9.3		7.6	8.1	
Effective Green, g (s)	17.2	33.9		2.4	19.1		8.8	9.3		7.6	8.1	
Actuated g/C Ratio	0.25	0.49		0.03	0.28		0.13	0.13		0.11	0.12	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	440	1637		61	476		225	214		194	186	
v/s Ratio Prot	c0.18	0.11		0.02	c0.16		c0.09	0.00		0.07	c0.02	
v/s Ratio Perm												
v/c Ratio	0.73	0.22		0.59	0.59		0.69	0.02		0.67	0.16	
Uniform Delay, d1	23.9	10.1		32.9	21.7		28.9	26.0		29.6	27.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.0	0.1		14.4	1.9		8.5	0.0		8.8	0.4	
Delay (s)	29.8	10.2		47.3	23.5		37.4	26.0		38.4	27.9	
Level of Service	C	B		D	C		D	C		D	C	
Approach Delay (s)	18.4			25.9			35.5			31.5		
Approach LOS	B			C			D			C		
Intersection Summary												
HCM Average Control Delay	24.8						HCM Level of Service					
HCM Volume to Capacity ratio	0.59						C					
Actuated Cycle Length (s)	69.2						Sum of lost time (s)					
Intersection Capacity Utilization	68.2%						ICU Level of Service					
Analysis Period (min)	15						C					
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
11: Yosemite Avenue & Union Road

Cumulative Plus Project With Mitigation
AM Peak Hour

	Northbound Avenue & Green Road											
	Left			Thru			Right			Left		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	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	1770	3539	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	180	251	138	112	287	120	172	812	141	140	838	270
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)	196	273	150	122	312	130	187	883	153	152	911	293
RTOR Reduction (vph)	0	0	122	0	0	106	0	0	79	0	0	152
Lane Group Flow (vph)	196	273	28	122	312	24	187	883	74	152	911	141
Turn Type	Prot	Prot	Perm	Prot	Perm	Perm	Prot	Perm	Perm	Prot	Prot	Perm
Protected Phases	7	4	3	8	5	2	1	6				
Permitted Phases												
Actuated Green, G (s)	4.0	13.9	13.9	4.0	13.9	13.9	5.0	36.3	36.3	5.0	36.3	36.3
Effective Green, g (s)	4.0	13.9	13.9	4.0	13.9	13.9	5.0	36.3	36.3	5.0	36.3	36.3
Actuated g/C Ratio	0.05	0.18	0.18	0.05	0.18	0.18	0.07	0.48	0.48	0.07	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	183	654	293	94	654	293	118	1708	764	118	1708	764
v/s Ratio Prot	0.06	0.08		c0.07	c0.09		c0.11	0.25		0.09	c0.26	
v/s Ratio Perm			0.02			0.02						0.09
v/c Ratio	1.07	0.42	0.09	1.30	0.48	0.08	1.58	0.52	0.10	1.29	0.53	0.19
Uniform Delay, d1	35.6	27.1	25.4	35.6	27.4	25.4	35.1	13.4	10.6	35.1	13.5	11.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	86.7	0.4	0.1	192.2	0.6	0.1	299.5	1.1	0.3	179.0	1.2	0.5
Delay (s)	122.3	27.5	25.6	227.8	28.0	25.5	334.6	14.5	10.8	214.1	14.7	11.6
Level of Service	F	C	C	F	C	C	F	B	B	F	B	B
Approach Delay (s)	57.0			70.6			63.0			36.4		
Approach LOS	E			E			E			D		
Intersection Summary												
HCM Average Control Delay	53.6						HCM Level of Service					
HCM Volume to Capacity ratio	0.66						D					
Actuated Cycle Length (s)	75.2						Sum of lost time (s)					
Intersection Capacity Utilization	59.2%						ICU Level of Service					
Analysis Period (min)	15						B					
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
12: Wawona Street & Union Road

Cumulative Plus Project With Mitigation
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.95	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1694		1770	1863	1583	1770	5010		1770	3517	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1694		1770	1863	1583	1770	5010		1770	3517	
Volume (vph)	115	115	177	230	95	150	96	860	94	155	893	40
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	125	192	250	103	163	104	935	102	168	971	43
RTOR Reduction (vph)	0	62	0	0	0	39	0	14	0	0	3	0
Lane Group Flow (vph)	125	255	0	250	103	124	104	1023	0	168	1011	0
Turn Type	Prot	7		Prot		pm+ov	Prot	5		Prot	1	
Protected Phases		4			3	8		2			6	
Permitted Phases						8						
Actuated Green, G (s)	6.7	16.2		9.4	18.9	31.2	8.2	23.6		12.3	27.7	
Effective Green, g (s)	6.7	16.2		9.4	18.9	31.2	8.2	23.6		12.3	27.7	
Actuated g/C Ratio	0.09	0.21		0.12	0.24	0.40	0.11	0.30		0.16	0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	153	354		215	454	719	187	1526		281	1257	
v/s Ratio Prot	0.07	c0.15		c0.14	c0.06	0.03	0.06	0.20		c0.09	c0.29	
v/s Ratio Perm						0.05						
v/c Ratio	0.82	0.72		1.16	0.23	0.17	0.56	0.67		0.60	0.80	
Uniform Delay, d1	34.8	28.5		34.0	23.5	14.9	32.9	23.6		30.3	22.5	
Incremental Delay	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Progression Factor, d2	27.4	6.8		112.3	0.3	0.1	3.6	1.2		3.4	3.8	
Delay (s)	62.2	35.4		146.3	23.7	15.0	36.5	24.7		33.7	26.3	
Level of Service	E	D		F	C	B	D	C		C	C	
Approach Delay (s)		43.0			80.4			25.8			27.3	
Approach LOS		D			F			C			D	
Intersection Summary												
HCM Average Control Delay	37.2			HCM Level of Service						D		
HCM Volume to Capacity ratio	0.81											
Actuated Cycle Length (s)	77.5			Sum of lost time (s)						16.0		
Intersection Capacity Utilization	74.3%			ICU Level of Service						D		
Analysis Period (min)	15											
c. Critical Lane Group												

Cumulative Plus Project With Mitigation
AM Peak Hour

Fehr & Peers Associates, Inc. Synchro 6 Report

Cumulative Plus Project With Mitigation
AM Peak Hour

Fehr & Peers Associates, Inc. Synchro 6 Report

Cumulative Plus Project With Mitigation
AM Peak Hour

Fehr & Peers Associates, Inc. Synchro 6 Report

Cumulative Plus Project With Mitigation
AM Peak Hour

Fehr & Peers Associates, Inc. Synchro 6 Report

Manteca Lowes
1: Yosemite Avenue & Airport Way

Cumulative Plus Project With Mitigation

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Friction	1.00	1.00	0.85	1.00	0.94	1.00	0.96	1.00	0.97	1.00	0.97	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3335	1770	3401	1770	3448	1770	3448	1770
Fit Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3335	1770	3401	1770	3448	1770	3448	1770
Volume (vph)	230	660	161	153	280	175	102	851	299	205	700	145
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)	250	717	175	166	304	190	111	925	325	223	761	158
RTOR Reduction (vph)	0	0	135	0	100	0	0	34	0	0	16	0
Lane Group Flow (vph)	250	717	40	166	394	0	111	1216	0	223	903	0
Turn Type	Prot	Perm	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.0	22.8	22.8	12.1	20.9		8.8	34.9		13.0	39.1	
Effective Green, g (s)	14.0	22.8	22.8	12.1	20.9		8.8	34.9		13.0	39.1	
Actuated g/C Ratio	0.14	0.23	0.23	0.12	0.21		0.09	0.35		0.13	0.40	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	251	817	365	217	705		158	1201		233	1365	
v/s Ratio Prot	c0.14	c0.20		0.09	0.12		0.06	c0.36		c0.13	0.28	
v/s Ratio Perm			0.03									
v/c Ratio	1.00	0.88	0.11	0.76	0.56		0.70	1.01		0.96	0.66	
Uniform Delay, d1	42.4	36.7	30.0	42.0	34.8		43.7	31.9		42.6	24.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	55.3	10.5	0.1	14.8	1.0		13.2	29.0		46.5	1.2	
Delay (s)	97.7	47.2	30.1	56.8	35.8		57.0	61.0		89.1	25.6	
Level of Service	F	D	C	E	D		E	C		F	C	
Approach Delay (s)		55.6			41.1			60.7			38.0	
Approach LOS		E			D			E			D	
Intersection Summary												
HCM Average Control Delay				50.3			HCM Level of Service			D		
HCM Volume to Capacity ratio				0.94								
Actuated Cycle Length (s)				98.8			Sum of lost time (s)		12.0			
Intersection Capacity Utilization				84.5%			ICU Level of Service		E			
Analysis Period (min)				15								
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
2: Wawona Street & Airport Way

Cumulative Plus Project With Mitigation

PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.95
Friction	0.96	0.98	1.00	0.98	1.00	1.00
Fit Protected	0.97	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1722	3455	1770	3539	1770	3539
Fit Permitted	0.97	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1722	3455	1770	3539	1770	3539
Volume (vph)	112	55	1197	227	105	909
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	122	60	1301	247	114	988
RTOR Reduction (vph)	29	0	18	0	0	0
Lane Group Flow (vph)	153	0	1530	0	114	988
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	10.8		35.2		6.0	45.2
Effective Green, g (s)	10.8		35.2		6.0	45.2
Actuated g/C Ratio	0.17		0.55		0.09	0.71
Clearance Time (s)	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	291		1900		166	2499
v/s Ratio Prot	c0.09		c0.44		c0.06	0.28
v/s Ratio Perm						
v/c Ratio	0.53		0.81		0.69	0.40
Uniform Delay, d1	24.3		11.6		28.1	3.8
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	1.7		2.6		11.2	0.1
Delay (s)	26.0		14.2		39.3	3.9
Level of Service	C		B		D	A
Approach Delay (s)	26.0		14.2		7.6	
Approach LOS	C		B		A	
Intersection Summary						
HCM Average Control Delay			12.4		HCM Level of Service	B
HCM Volume to Capacity ratio			0.73			
Actuated Cycle Length (s)			64.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			65.7%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
3: Daniels Street & Airport Way

Cumulative Plus Project With Mitigation

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Friction	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00
Fit 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	1863	1583	3433	1863	1583	3433	3539	1583	1770	3539	1770
Fit 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	1863	1583	3433	1863	1583	3433	3539	1583	1770	3539	1770
Volume (vph)	450	291	690	726	92	152	545	662	882	80	89	642
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)	489	316	750	789	100	165	582	720	741	87	97	698
RTOR Reduction (vph)	0	0	9	0	0	101	0	141	0	0	0	0
Lane Group Flow (vph)	489	316	741	789	100	64	592	720	600	0	184	698
Turn Type	Prot	pm+ov	Prot	Prot	Perm	Prot	pm+ov	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4	5	3	8		5	2	3	1	1	6
Permitted Phases			4			8			2			
Actuated Green, G (s)	21.5	24.6	50.0	26.5	29.6	29.6	25.4	36.5	63.0		16.4	27.5
Effective Green, g (s)	21.5	24.6	50.0	26.5	29.6	29.6	25.4	36.5	63.0		16.4	27.5
Actuated g/C Ratio	0.18	0.20	0.42	0.22	0.25	0.25	0.21	0.30	0.52		0.14	0.23
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	615	382	712	758	460	390	727	1076	884		242	811
v/s Ratio Prot	0.14	0.17	c0.22	c0.23	0.05		0.17	0.20	0.15		0.10	c0.20
v/s Ratio Perm			0.25			0.04			0.23			
v/c Ratio	0.80	0.83	1.04	1.04	0.22	0.16	0.81	0.67	0.68		0.76	0.86
Uniform Delay, d1	47.1	45.7	35.0	46.8	36.0	35.5	45.1	36.5	21.0		49.9	44.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.15	1.02	0.70		1.00	1.00
Incremental Delay, d2	7.0	13.7	44.6	43.8	0.2	0.2	6.1	2.9	1.8		13.1	11.6
Delay (s)	54.2	59.3	79.6	90.5	36.2	35.7	57.8	40.2	16.6		63.0	56.0
Level of Service	D	E	E	F	D	D	E	D	B		E	E
Approach Delay (s)		67.5			76.8			36.8				50.4
Approach LOS		E			E			D				D
Intersection Summary												
HCM Average Control Delay				55.0			HCM Level of Service		D			
HCM Volume to Capacity ratio				0.99								
Actuated Cycle Length (s)				120.0			Sum of lost time (s)		12.0			
Intersection Capacity Utilization				91.2%			ICU Level of Service		F			
Analysis Period (min)				15								
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
3: Daniels Street & Airport Way

Cumulative Plus Project With Mitigation

PM Peak Hour

Movement	SBR
Lane Configurations	↔
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Volume (vph)	210
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	228
RTOR Reduction (vph)	85
Lane Group Flow (vph)	143
Turn Type	pm+ov
Protected Phases	7
Permitted Phases	6
Actuated Green, G (s)	49.0
Effective Green, g (s)	49.0
Actuated g/C Ratio	0.41
Clearance Time (s)	4.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	699
v/s Ratio Prot	0.04
v/s Ratio Perm	0.05
v/c Ratio	0.20
Uniform Delay, d1	22.9
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	23.1
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Manteca Lowes
4: SR 120 WB & Airport Way

Cumulative Plus Project With Mitigation

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Lane Util. Factor				0.97	0.95	0.95	0.97	0.91		0.91	1.00	0.85
Flt				1.00	0.85	0.85	1.00	1.00		1.00	0.85	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00		1.00	1.00	1.00
Satd. Flow (prot)				3433	1504	1504	3433	5085		5085	1583	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)				3433	1504	1504	3433	5085		5085	1583	1583
Volume (vph)	0	0	0	210	0	492	630	1397	0	0	1394	664
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	228	0	535	685	1518	0	0	1515	722
RTOR Reduction (vph)	0	0	0	0	49	49	0	0	0	0	0	328
Lane Group Flow (vph)	0	0	0	228	218	219	685	1518	0	0	1515	394
Turn Type	Split			Perm			Prot			Perm		
Protected Phases	8			8			5			2		
Permitted Phases	8			8			5			2		
Actuated Green, G (s)	22.0			22.0			39.7			90.0		
Effective Green, g (s)	22.0			22.0			39.7			90.0		
Actuated g/C Ratio	0.18			0.18			0.33			0.75		
Clearance Time (s)	4.0			4.0			4.0			4.0		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	629			276			1136			3814		
v/s Ratio Prot	0.07			0.14			c0.20			c0.30		
v/s Ratio Perm	0.07			0.14			c0.20			c0.30		
v/c Ratio	0.36			0.79			0.79			0.60		
Uniform Delay, d1	42.9			46.8			46.8			33.6		
Progression Factor	1.00			1.00			1.00			0.24		
Incremental Delay, d2	0.4			13.9			14.4			1.2		
Delay (s)	43.2			60.7			61.3			9.4		
Level of Service	D			E			A			C		
Approach Delay (s)	0.0			55.7			5			3.2		
Approach LOS	A			E			A			B		
Intersection Summary												
HCM Average Control Delay	17.1			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	79.2%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
5: SR 120 EB & Airport Way

Cumulative Plus Project With Mitigation

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1500	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	
Lane Util. Factor	0.95	0.95	0.88						0.91	1.00	0.97	0.91
Frt	1.00	1.00	0.85						1.00	0.85	1.00	1.00
Flt Protected	0.95	0.95	1.00						1.00	1.00	0.95	1.00
Satd. Flow (prot)	1681	1681	2787						5085	1583	3433	5085
Flt Permitted	0.95	0.95	1.00						1.00	1.00	0.95	1.00
Satd. Flow (perm)	1681	1681	2787						5085	1583	3433	5085
Volume (vph)	743	0	805				0	1284	425	558	1046	0
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)	808	0	875	0	0	0	0	1396	462	607	1137	0
RTOR Reduction (vph)	0	0	94	0	0	0	0	0	136	0	0	0
Lane Group Flow (vph)	404	404	781	0	0	0	0	1396	328	607	1137	0
Turn Type	Prot	Perm		Prot		Perm		Prot		Perm		
Protected Phases	7	4		2		1		6				
Permitted Phases	4			2			1			6		
Actuated Green, G (s)	42.0	42.0	42.0	39.0			39.0			70.0		
Effective Green, g (s)	42.0	42.0	42.0	39.0			39.0			70.0		
Actuated g/C Ratio	0.35	0.35	0.35	0.32			0.32			0.58		
Clearance Time (s)	4.0	4.0	4.0	4.0			4.0			4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0			3.0		
Lane Grp Cap (vph)	588	588	975	1653			514			772		
v/s Ratio Prot	0.24	0.24		c0.27			c0.18			0.22		
v/s Ratio Perm			c0.28	0.21								
v/c Ratio	0.69	0.69	0.80	0.84			0.63			0.79		
Uniform Delay, d1	33.4	33.4	35.2	37.7			34.4			43.8		
Progression Factor	1.00	1.00	1.00	0.65			0.39			0.75		
Incremental Delay, d2	3.3	3.3	4.8	3.3			3.5			3.3		
Delay (s)	36.7	36.7	40.0	27.9			16.8			36.2		
Level of Service	D	D	D	C			B			A		
Approach Delay (s)	38.4	0.0		25.1			13.2			13.2		
Approach LOS	D	A		C			B			B		
Intersection Summary												
HCM Average Control Delay	25.4			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.81											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	79.2%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
6: Atherton Road & Airport Way

Cumulative Plus Project With Mitigation

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	0.97	1.00	1.00	1.00	1.00	1.00	0.91	0.97	0.91	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	1.00	1.00	0.85	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1863	1583	1770	5021	3433	5085	1583	1583

Cumulative Plus Project With Mitigation
PM Peak HourFehr & Peers Associates, Inc. Synchro 6 Report

Cumulative Plus Project With Mitigation
PM Peak Hour

Fehr & Peers Associates, Inc. Synchro 6 Report

Cumulative Plus Project With Mitigation
PM Peak Hour

Fehr & Peers Associates, Inc. Synchro 6 Report

Cumulative Plus Project With Mitigation
PM Peak Hour

Fehr & Peers Associates, Inc. Synchro 6 Report

Manteca Lowes
14: SR 120 WB Ramps & Union Road

Cumulative Plus Project With Mitigation
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Lane Util. Factor				0.95	0.91	0.95	0.97	0.95		0.95	1.00	0.85
Flt				1.00	0.85	0.85	1.00	1.00		1.00	0.85	1.00
Flt Protected				0.95	1.00	1.00	0.95	1.00		1.00	0.95	1.00
Satd. Flow (prot)				1681	1441	1504	3433	3539		3539	1583	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00		1.00	0.95	1.00
Satd. Flow (perm)				1681	1441	1504	3433	3539		3539	1583	1583
Volume (vph)		0	0	0	125	0	354	488	1271	0	0	787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)		0	0	0	136	0	385	530	1382	0	0	855
RTOR Reduction (vph)		0	0	0	55	55	0	0	0	0	0	202
Lane Group Flow (vph)		0	0	0	136	137	138	530	1382	0	0	855
Turn Type	Split			Perm			Prot			Perm		
Protected Phases	8			8			5			2		
Permitted Phases	8			8			5			2		
Actuated Green, G (s)	13.7			13.7			36.3			68.3		
Effective Green, g (s)	13.7			13.7			36.3			68.3		
Actuated g/C Ratio	0.15			0.15			0.40			0.76		
Clearance Time (s)	4.0			4.0			4.0			4.0		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	256			219			229			1385		
v/s Ratio Prot	0.08			c0.10			0.15			c0.39		
v/s Ratio Perm	0.53			0.63			0.60			0.38		
v/c Ratio	0.53			0.63			0.60			0.38		
Uniform Delay, d1	35.2			35.7			35.6			18.9		
Progression Factor	1.00			1.00			1.00			0.25		
Incremental Delay, d2	2.1			5.5			4.4			0.5		
Delay (s)	37.3			41.2			40.0			5.2		
Level of Service	D			D			A			B		
Approach Delay (s)	0.0			39.7			3.2			14.9		
Approach LOS	A			D			A			B		
Intersection Summary												
HCM Average Control Delay	12.3			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.64											
Actuated Cycle Length (s)	90.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	65.0%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

Synchro 6 Report

Manteca Lowes
15: SR 120 EB Ramps & Union Road

Cumulative Plus Project With Mitigation
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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									
Lane Util. Factor	0.95	0.95	0.88									
Flt	1.00	1.00	0.85									
Flt Protected	0.95	0.95	1.00									
Satd. Flow (prot)	1681	1681	2787									
Flt Permitted	0.95	0.95	1.00									
Satd. Flow (perm)	1681	1681	2787									
Volume (vph)	735		704	0	0	0	0	1024	215	269	643	0
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)	799	0	765	0	0	0	0	1113	234	292	699	0
RTOR Reduction (vph)	0	0	263	0	0	0	0	0	164	0	0	0
Lane Group Flow (vph)	400	399	502	0	0	0	0	1113	70	292	699	0
Turn Type	Prot			Perm			Perm			Prot		
Protected Phases	7			4			2			1		
Permitted Phases	7			4			2			1		
Actuated Green, G (s)	36.9			36.9			27.1			14.0		
Effective Green, g (s)	36.9			36.9			27.1			14.0		
Actuated g/C Ratio	0.41			0.41			0.30			0.16		
Clearance Time (s)	4.0			4.0			4.0			4.0		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	689			689			1143			1531		
v/s Ratio Prot	c0.24			0.24			c0.22			c0.17		
v/s Ratio Perm	0.58			0.58			0.18			0.04		
v/c Ratio	0.58			0.58			0.18			0.04		
Uniform Delay, d1	20.6			20.5			19.1			28.1		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	1.3			1.2			0.3			3.1		
Delay (s)	21.8			21.7			19.4			31.2		
Level of Service	C			C			C			F		
Approach Delay (s)	20.6			0.0			29.9			43.0		
Approach LOS	C			A			C			D		
Intersection Summary												
HCM Average Control Delay	29.5			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.72											
Actuated Cycle Length (s)	90.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	65.0%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

Fehr & Peers Associates, Inc.

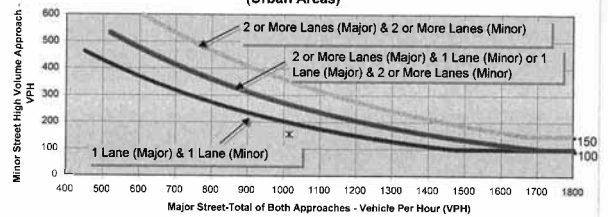
Synchro 6 Report

Manteca Lowes
16: Atherton Road & Union Road

Cumulative Plus Project With Mitigation
PM Peak Hour

												
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Flt	1.00	0.99		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3507		1770	3539	1583	3433	3470		3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3507		1770	3539	1583	3433	3470		3433	3539	1583
Volume (vph)	450	310	20	60	280	523	10	266	40	504	473	370
Peak-hour volume, PHF Adj. Flow (vph)	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Act. Flow (vph)	489	337	22	65	304	568	11	289	43	548	514	402
Ratio g/C Ratio	0	4	0	0	0	351	0	16	0	0	0	212
Lane Group Flow (vph)	489	355	0	65	304	217	11	322	0	548	514	402
Turn Type	Pro				Perm	Pro		Pro		Pro		
Permitted Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	20.3	32.9		7.8	20.4	20.4	1.2	31.6		21.7	52.1	52.1
Effective Green, G (s)	20.3	32.9		7.8	20.4	20.4	1.2	31.6		21.7	52.1	52.1
Actuated g/C Ratio	0.18	0.30		0.07	0.19	0.18	0.01	0.28		0.20	0.47	0.47
Cearence Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	634	1049		126	656	294	37	997		677	1676	750
v/s Ratio Prot	c0.14	0.10		0.04	0.09		0.00	0.09		c0.16	c0.15	
v/s Ratio Perm						c0.14						0.12
v/c Ratio	0.77	0.34		0.52	0.46	0.74	0.30	0.32		0.81	0.31	0.25
Uniform Delay, d1	42.6	30.1		49.3	39.9	42.3	54.0	30.8		42.2	17.8	17.8
Preemption Delay, d2	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.8	0.2		3.5	0.5	9.3	4.5	0.9		7.1	0.5	0.7
Delay (s)	48.4	30.3		52.8	40.4	51.6	58.4	31.7		49.3	18.3	18.5
Level of Service	D	C		D	D	D	E	C		D	B	B
Approach Delay (s)	40.7				48.0			32.5			29.8	C
Approach LOS	D				D			C			B	
Intersection Summary												
HCM Average Control Delay		37.4								D		
HCM Volume to Capacity Ratio		0.60										
Actuated Cycle Length (s)		110.0				Sum of lost time (s)			12.0			
Intersection Capacity Utilization		63.8%				ICU Level of Service			B			
Analysis Period (min)		15										
c. Critical Lane Group												

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



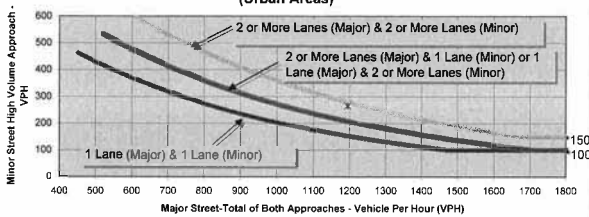
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1015	155	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



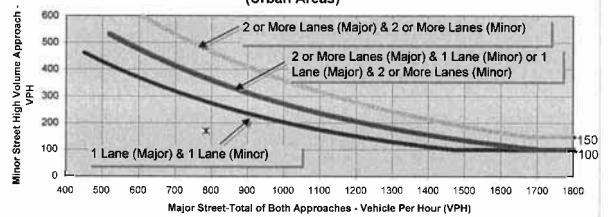
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1195	265	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



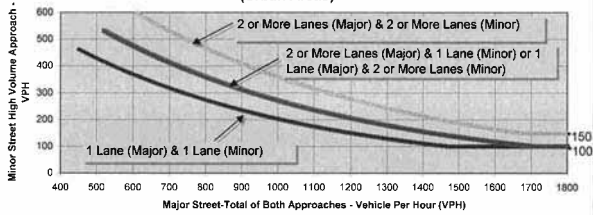
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		785	170	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



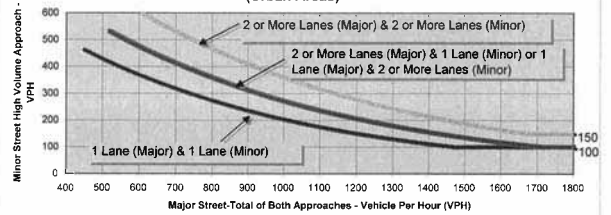
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	535	95	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



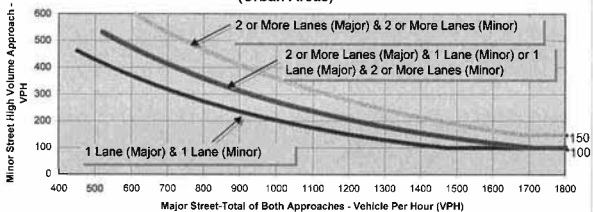
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	355	110	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



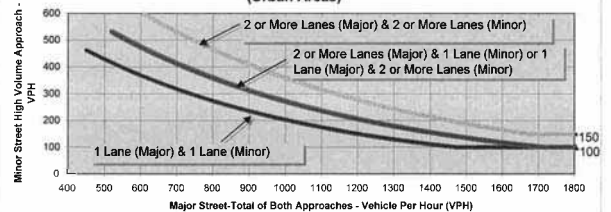
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	175	85	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



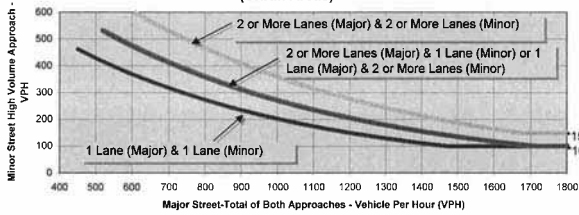
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	110	35	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



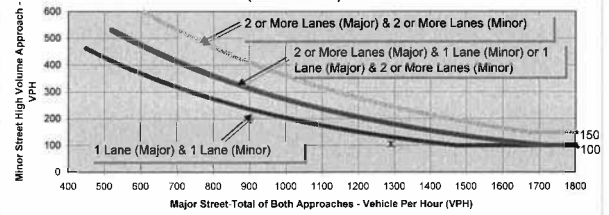
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	115	90	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



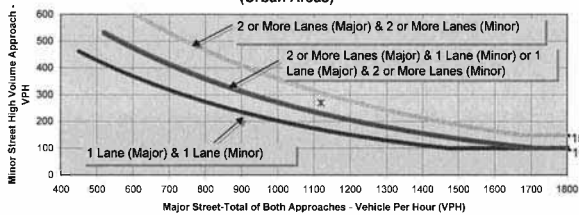
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1290	105	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



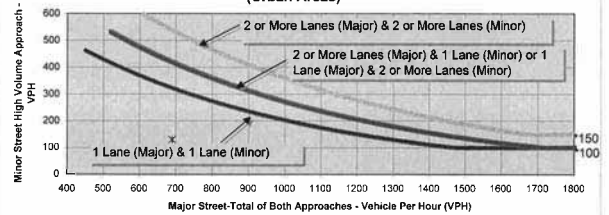
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1120	270	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



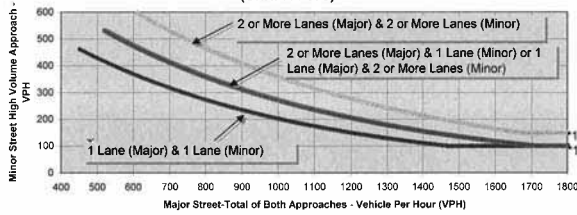
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	690	130	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



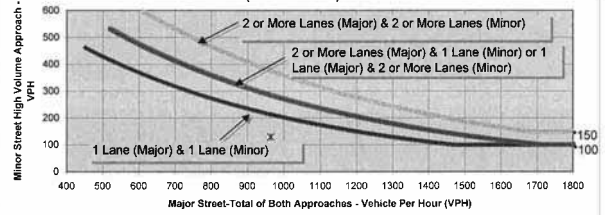
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	480	115	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



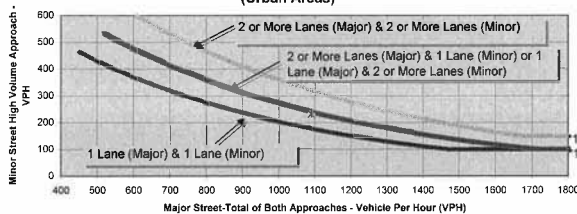
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	965	130	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



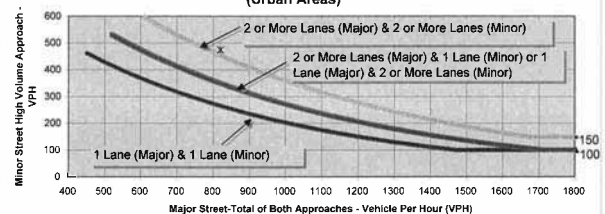
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1090	230	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



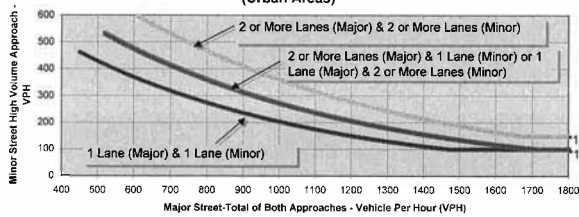
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	820	475	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



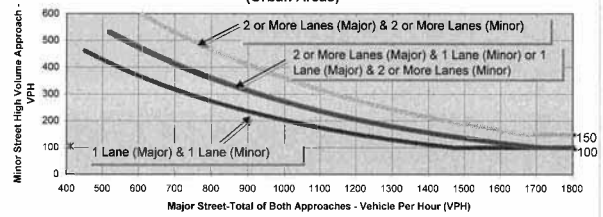
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	675	100	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



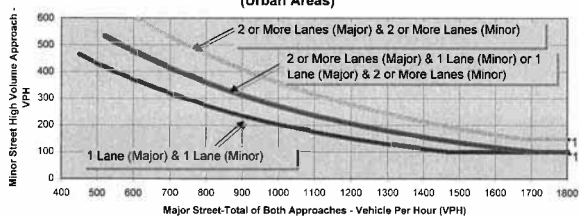
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	410	105	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



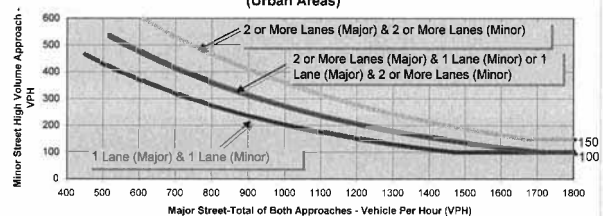
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	175	40	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**

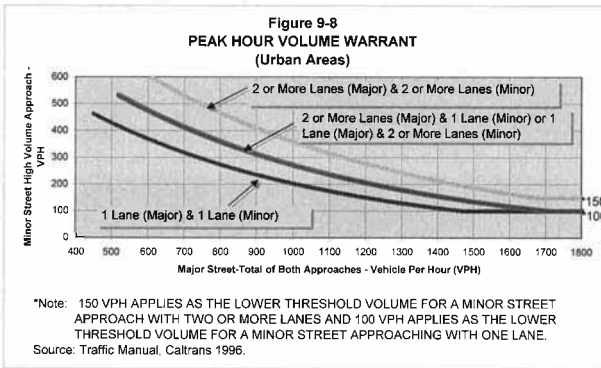


*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	135	25	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

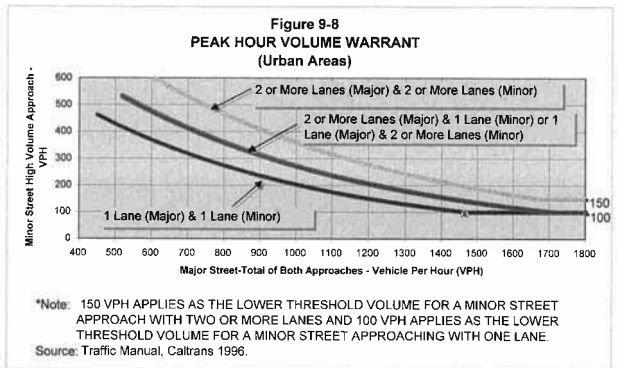
- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	145	55	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

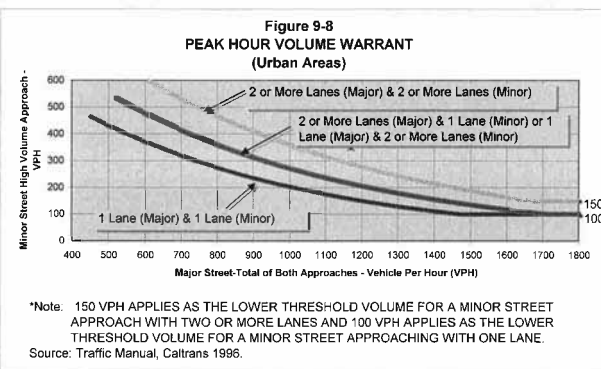
- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1465	95	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

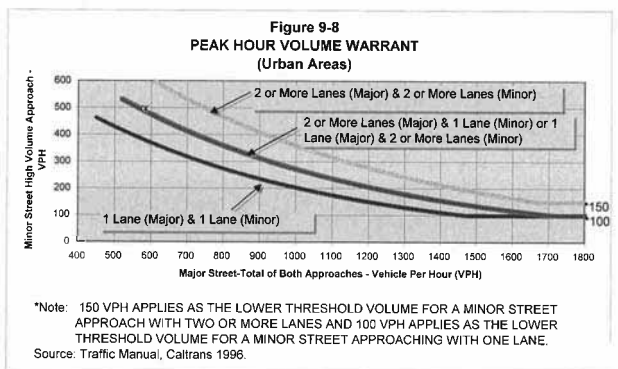
- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1170	350	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions



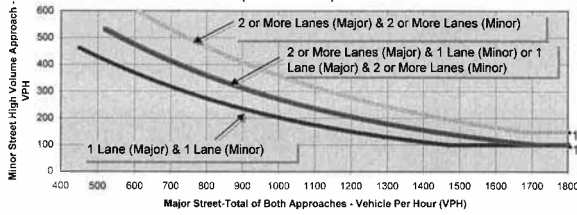
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	585	495	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

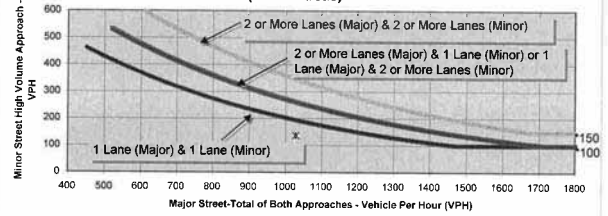
Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		310	135	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☒ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

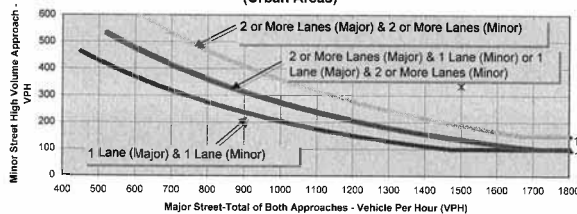
Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1028	137	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

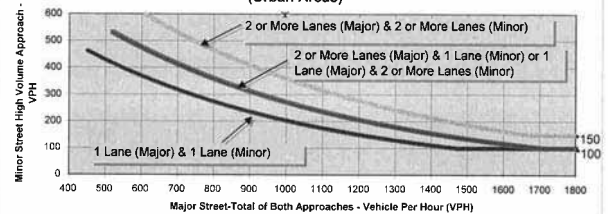
Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		1500	335	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

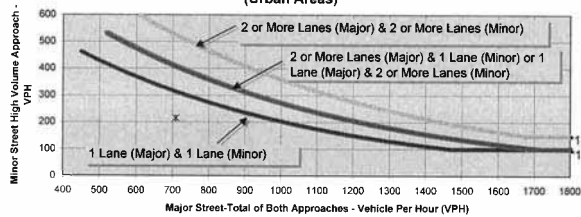
Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	YES
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		995	596	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Project No. RS07-2399 Page No. 1
Subject Existing Plus Project - PM
Airport Wy. & Atherton Rd.
Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 4 of 12

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

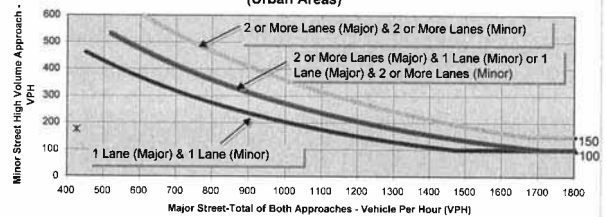
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	709	215	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Project No. RS07-2399 Page No. 1
Subject Existing Plus Project - PM
Airport Wy. & Woodward Ave.
Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 5 of 12

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

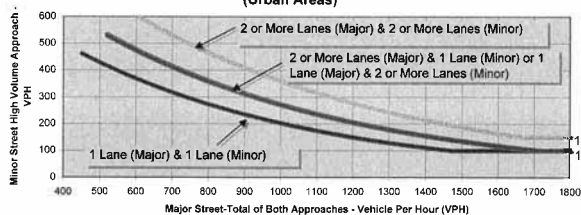
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	426	175	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Project No. RS07-2399 Page No. 1
Subject Existing Plus Project - PM
Daniels St. & Fishback Rd.
Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 6 of 12

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

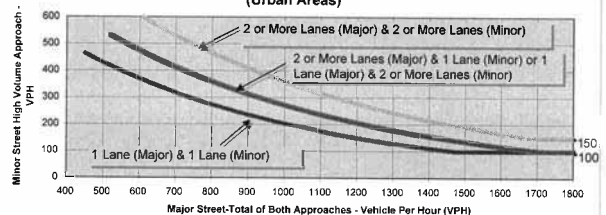
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	366	594	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Project No. RS07-2399 Page No. 1
Subject Existing Plus Project - PM
Daniels St. & Junction Dr.
Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 7 of 12

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

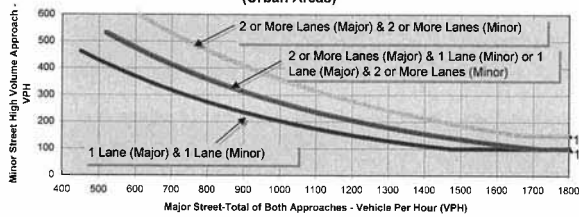
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	318	30	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Project No. **RS07-2399** Page No. **1**
Subject **Existing Plus Project - PM**
Daniels St. & Winters Dr.
Computed by **Fehr & Peers** Date **3/21/2007**
Checked by **Fehr & Peers** Date **3/21/2007**
Approved by **Fehr & Peers** Date **3/21/2007** Sheet No. **8** of **12**

Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

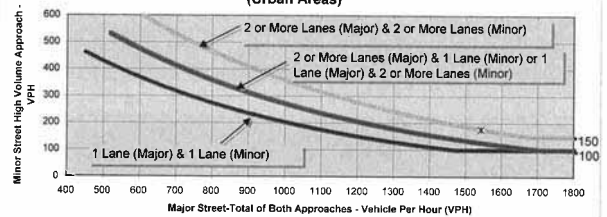
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	313	64	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Project No. **RS07-2399** Page No. **1**
Subject **Existing Plus Project - PM**
Union Rd. & Daniels St.
Computed by **Fehr & Peers** Date **3/21/2007**
Checked by **Fehr & Peers** Date **3/21/2007**
Approved by **Fehr & Peers** Date **3/21/2007** Sheet No. **9** of **12**

Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

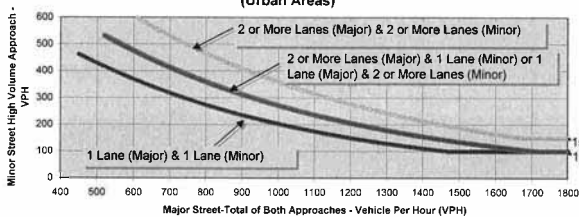
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1543	177	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Project No. **RS07-2399** Page No. **1**
Subject **Existing Plus Project - PM**
Union Rd. & SR 120 WB
Computed by **Fehr & Peers** Date **3/21/2007**
Checked by **Fehr & Peers** Date **3/21/2007**
Approved by **Fehr & Peers** Date **3/21/2007** Sheet No. **10** of **12**

Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

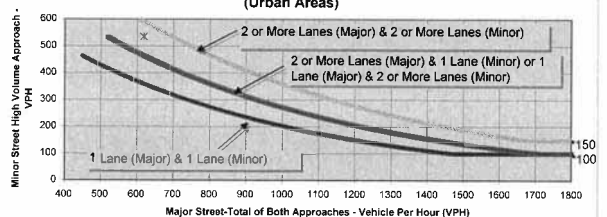
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1204	357	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Project No. **RS07-2399** Page No. **1**
Subject **Existing Plus Project - PM**
Union Rd. & SR 120 EB
Computed by **Fehr & Peers** Date **3/21/2007**
Checked by **Fehr & Peers** Date **3/21/2007**
Approved by **Fehr & Peers** Date **3/21/2007** Sheet No. **11** of **12**

Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



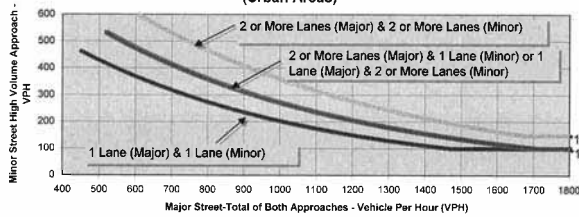
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	619	535	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



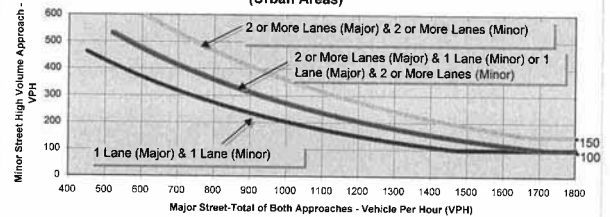
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	341	276	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



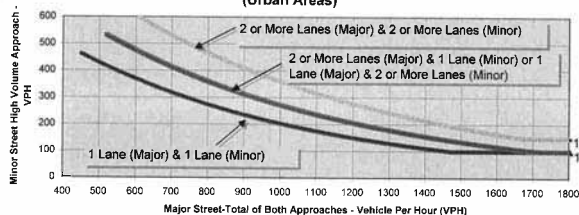
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1920	255	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☒ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



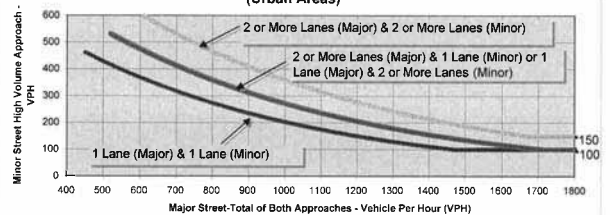
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1960	1075	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



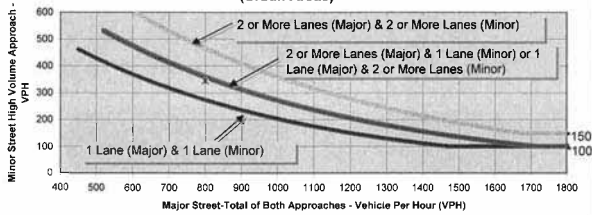
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1505	605	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



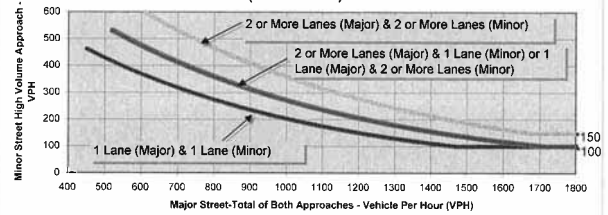
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	800	345	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



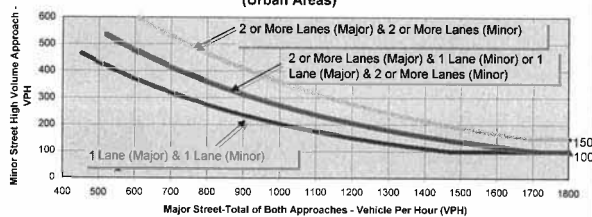
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	595	50	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



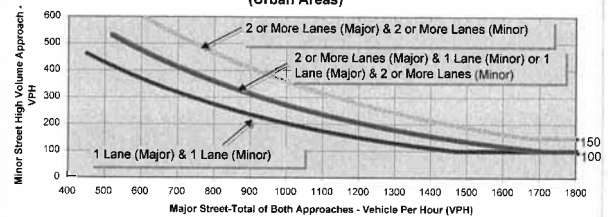
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	555	35	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

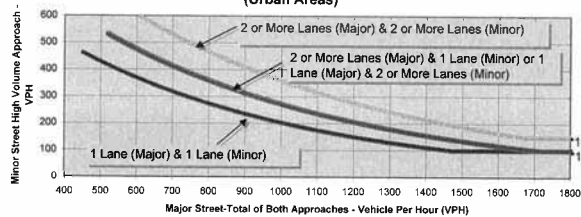
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	2280	415	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

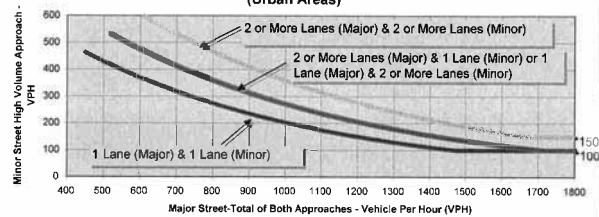
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	2590	415	YES

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

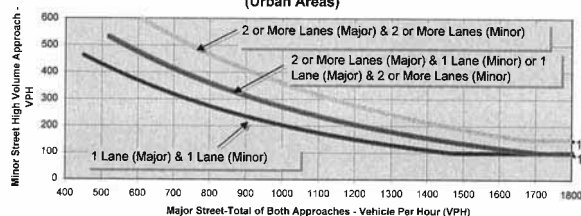
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	2020	620	YES

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

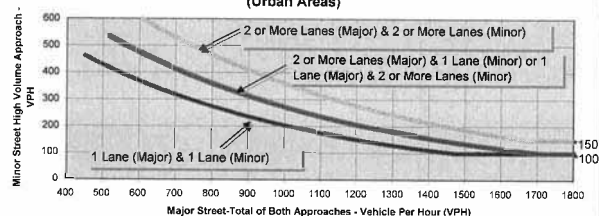
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1715	970	YES

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

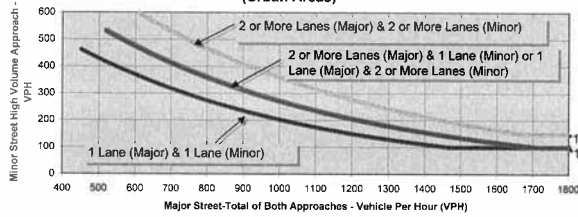
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	485	1120	YES

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

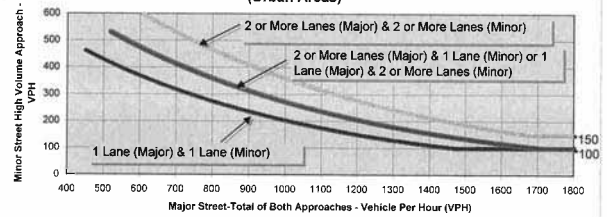
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	2360	160	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

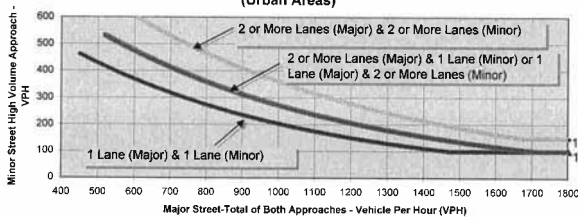
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	2755	1250	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

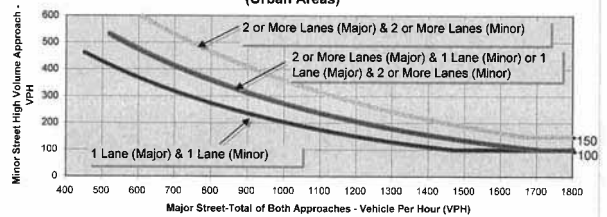
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1355	1565	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

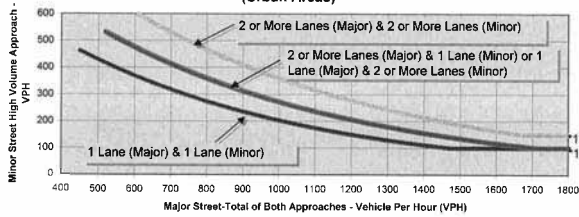
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1195	495	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

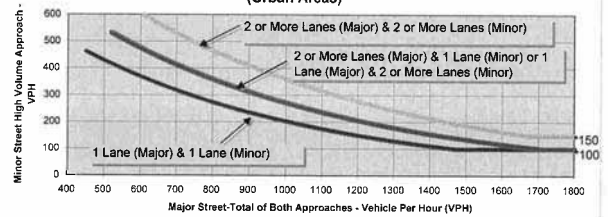
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	980	50	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

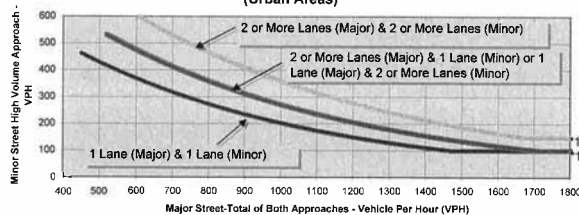
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	955	55	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

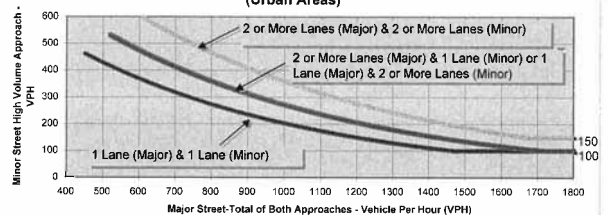
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	2665	505	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

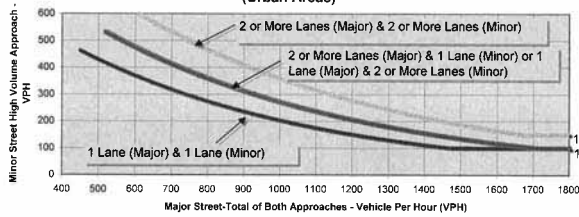
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1765	475	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

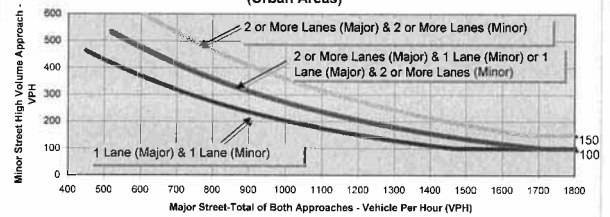
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	2100	1405	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

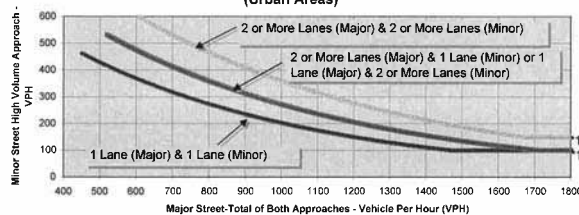
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1605	1620	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

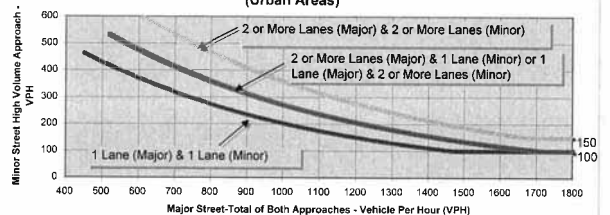
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	870	1270	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

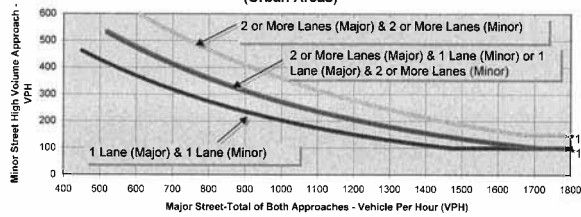
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1964	259	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☒ Cumulative No Project Conditions
☐ Cumulative Plus Project Conditions

Project No. RS07-2399 Page No. 1
Subject Cumulative Plus Project - AM
Airport Wy. & Atherton Rd.
Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 2 of 11

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

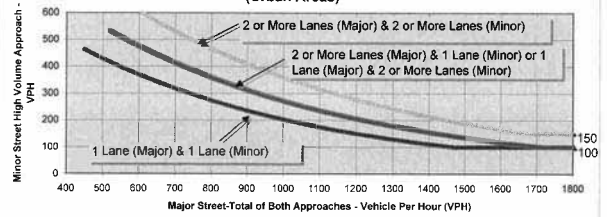
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1984	1088	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Project No. RS07-2399 Page No. 1
Subject Cumulative Plus Project - AM
Airport Wy. & Woodward Ave.
Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 3 of 11

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

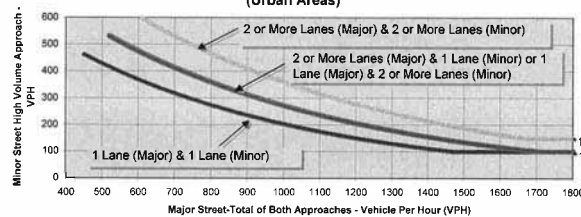
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1513	610	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Project No. RS07-2399 Page No. 1
Subject Cumulative Plus Project - AM
Daniels St. & Fishback Rd.
Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 4 of 11

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

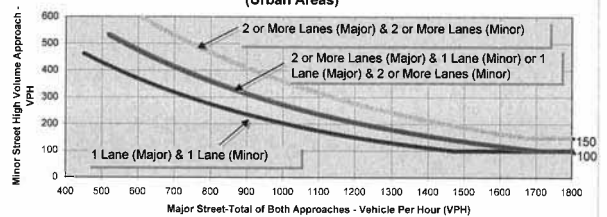
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1028	518	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Project No. RS07-2399 Page No. 1
Subject Cumulative Plus Project - AM
Daniels St. & Junction Dr.
Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 5 of 11

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



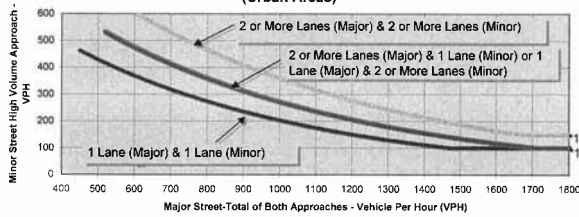
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	666	52	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



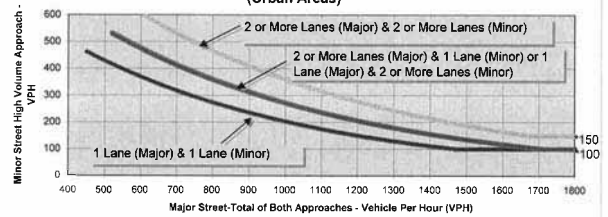
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	NO
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	621	39	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



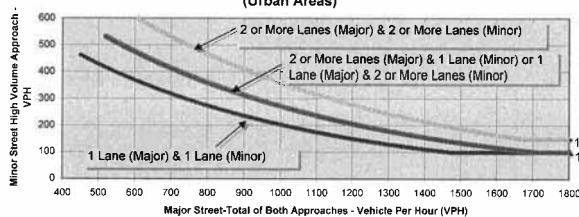
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	2317	447	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



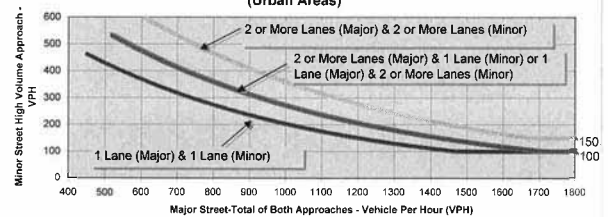
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	2615	417	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

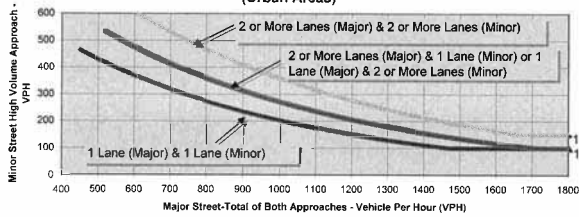
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	2045	634	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 10 of 11

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

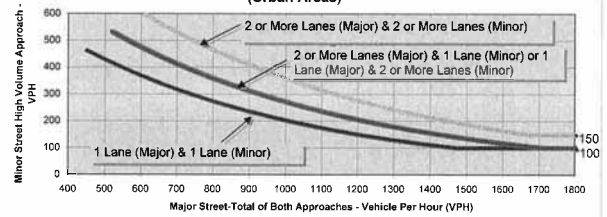
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1740	982	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 11 of 11

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

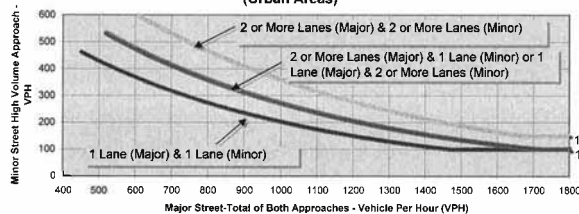
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	1132	488	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 1 of 11

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

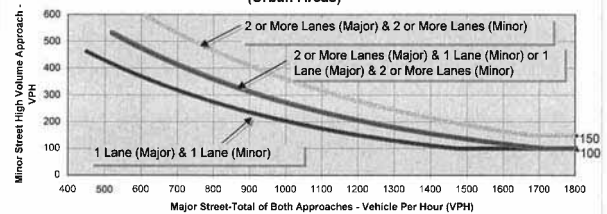
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	2438	167	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Computed by Fehr & Peers Date 3/21/2007
Checked by Date
Approved by Date Sheet No. 2 of 11

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



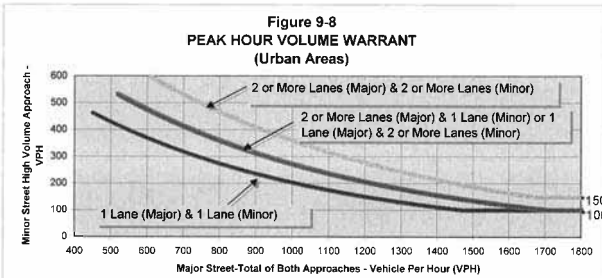
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	2809	1275	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by



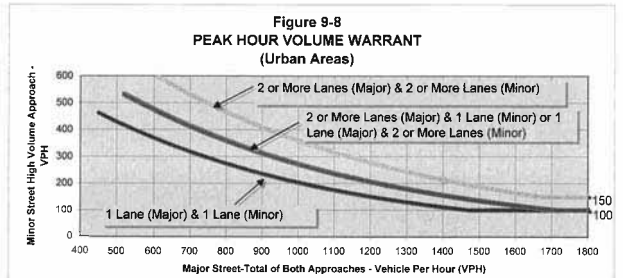
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1372	1575	YES

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by



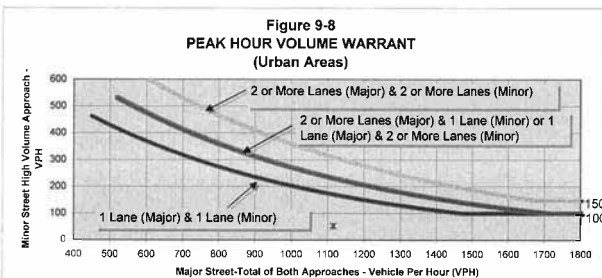
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1386	821	YES

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by



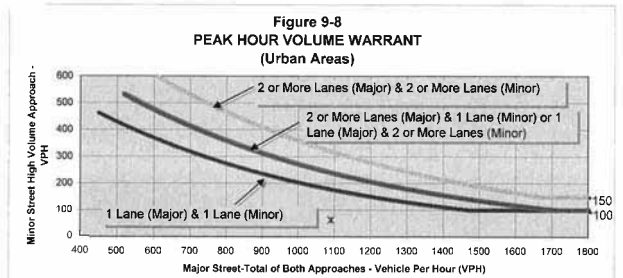
*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1116	52	NO

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by
Approved by

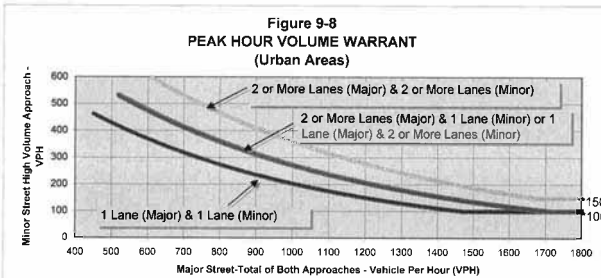


*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1091	63	NO

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

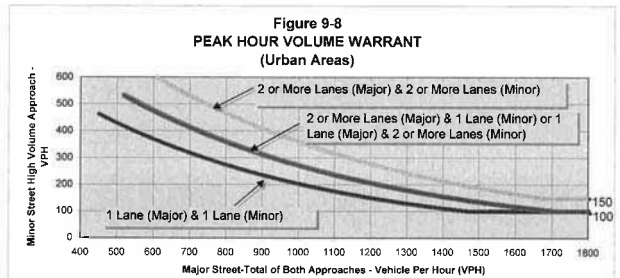


*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	2765	580	YES

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

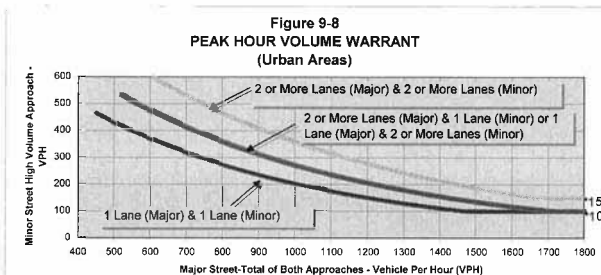


*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	2816	479	YES

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

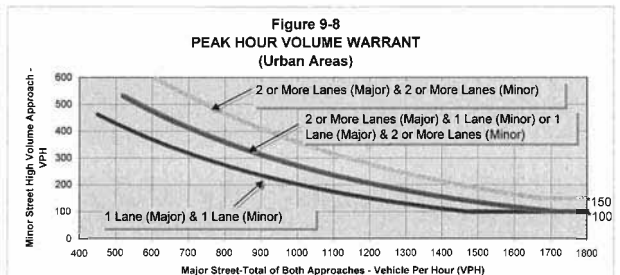


*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	2151	1439	YES

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

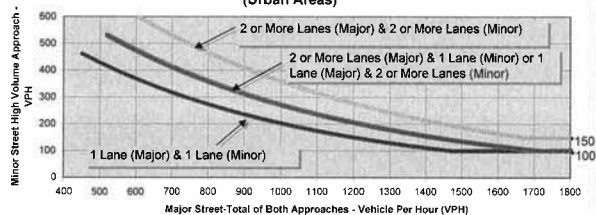
Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n
	One Lane (Y/N)	y	y
Traffic Volume (VPH) *	1663	1643	YES

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

Computed by Fehr & Peers
Checked by _____
Approved by _____

**Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)**



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street	Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	YES
	One Lane (Y/N)	y	
Traffic Volume (VPH) *	898	1166	

*Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
☐ Existing Plus Project Conditions
☐ Cumulative No Project Conditions
☒ Cumulative Plus Project Conditions

HCS+: Basic Freeway Segments Release 5.21

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

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Yosemite to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	1890	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	525	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1103	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1103	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	19.0	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Yosemite to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3400	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	944	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1983	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1983	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	56.7	mi/h
Number of lanes, N	2	
Density, D	35.0+	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	1925	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	535	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1123	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1123	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	19.4	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3180	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	883	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1855	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1855	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.6	mi/h
Number of lanes, N	2	
Density, D	32.2	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Main
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2040	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	567	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1190	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1190	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	20.5	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Main
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2940	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	817	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1715	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1715	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	29.6	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3165	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	879	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1846	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1846	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.7	mi/h
Number of lanes, N	2	
Density, D	32.0	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2405	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	668	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1403	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fn	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1403	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	24.2	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3290	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	914	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1919	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fn	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1919	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.2	mi/h
Number of lanes, N	2	
Density, D	33.5	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2220	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	617	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1295	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1295	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	22.3	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3570	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	992	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2083	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2083	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	55.3	mi/h
Number of lanes, N	2	
Density, D	37.7	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 2/15/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2200	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	611	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1283	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1283	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	22.1	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Yosemite to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	1932	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	537	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1127	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1127	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	19.4	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Yosemite to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3482	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	967	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2031	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2031	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	56.1	mi/h
Number of lanes, N	2	
Density, D	36.2	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	1959	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	544	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	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	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1143	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	19.7	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3262	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	906	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1903	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1903	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.4	mi/h
Number of lanes, N	2	
Density, D	33.2	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Main
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2069	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	575	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1207	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1207	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	20.8	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Main
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3009	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	836	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1755	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1755	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.9	mi/h
Number of lanes, N	2	
Density, D	30.3	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3198	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	888	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1866	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1866	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.6	mi/h
Number of lanes, N	2	
Density, D	32.4	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2471	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	686	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1441	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1441	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	24.8	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3330	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	925	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1943	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1943	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.0	mi/h
Number of lanes, N	2	
Density, D	34.1	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2298	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	638	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1341	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1341	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	23.1	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3608	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1002	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2105	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2105	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	54.9	mi/h
Number of lanes, N	2	
Density, D	38.3	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2287	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	635	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1334	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1334	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	23.0	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Yosemite to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3470	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	964	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2024	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2024	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	56.2	mi/h
Number of lanes, N	2	
Density, D	36.0	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Yosemite to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	5810	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1614	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	3389	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3389	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3030	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	842	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1768	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1768	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.9	mi/h
Number of lanes, N	2	
Density, D	30.5	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	5235	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1454	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	3054	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3054	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Main
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2715	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	754	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1584	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1584	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	27.3	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Main
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	4310	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1197	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2514	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fn	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2514	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	5350	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1486	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	3121	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fn	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3121	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2815	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	782	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1642	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1642	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	28.3	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	6000	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1667	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	3500	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3500	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3065	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	851	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1788	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1788	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.9	mi/h
Number of lanes, N	2	
Density, D	30.9	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	6115	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1699	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	3567	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3567	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3660	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1017	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2135	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2135	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	54.3	mi/h
Number of lanes, N	2	
Density, D	39.3	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Yosemite to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3504	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	973	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2044	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2044	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	55.9	mi/h
Number of lanes, N	2	
Density, D	36.6	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Yosemite to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	5875	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1632	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	3427	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3427	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3061	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	850	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1786	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1786	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.9	mi/h
Number of lanes, N	2	
Density, D	30.9	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Airport to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	5310	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1475	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	3098	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3098	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Main
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2734	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	759	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1595	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1595	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	27.5	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Eastbound
From/To: Union to Main
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	4355	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1210	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2540	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2540	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year:
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	5372	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1492	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	3134	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3134	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Main to Union
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	2857	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	794	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1667	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1667	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	58.0	mi/h
Number of lanes, N	2	
Density, D	28.7	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	6037	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1677	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	3522	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3522	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Union to Airport
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3136	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	871	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1829	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1829	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	57.8	mi/h
Number of lanes, N	2	
Density, D	31.7	pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: AM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	6147	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1708	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	3586	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3586	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst: Fehr & Peers
Agency or Company: Fehr & Peers
Date Performed: 5/24/2007
Analysis Time Period: PM Peak Hour
Freeway/Direction: SR 120 Westbound
From/To: Airport to Yosemite
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Flow Inputs and Adjustments

Volume, V	3728	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1036	v
Trucks and buses	10	%
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	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2175	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
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	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2175	pc/h/ln
Free-flow speed, FFS	58.0	mi/h
Average passenger-car speed, S	53.5	mi/h
Number of lanes, N	2	
Density, D	40.7	pc/mi/ln

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/15/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1890	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	170	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	205	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1890	170	205	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	525	47	57	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2205 198 239 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
 $v = v + (v - v) P = 2205$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	2205	4700	No
$F_i F$			
$v = v - v$	2007	4700	No
$FO F R$			
v	198	2000	No
R			
v			
v	0		(Equation 25-15 or 25-16)
$3 \text{ or } av34$			
Is v	> 2700 pc/h?	No	
$3 \text{ or } av34$			
Is v	> 1.5 v /2	No	
$3 \text{ or } av34$	12		
If yes, v =			(Equation 25-18)
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	2205	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 18.7$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.446$
S
Space mean speed in ramp influence area, $S = 54.7$ mph
R
Space mean speed in outer lanes, $S = N/A$ mph
0
Space mean speed for all vehicles, $S = 54.7$ mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/15/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Freeway Data

	Diverge	
Type of analysis	2	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3400	vph

Off Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-flow speed on ramp	475	vph
Volume on ramp	500	ft
Length of first accel/decel lane		ft
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	255	vph
Volume on adjacent ramp	Downstream	
Position of adjacent ramp	On	
Type of adjacent ramp	2000	ft
Distance to adjacent ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3400	475	255	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	944	132	71	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3967 554 298 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
 $v = v + (v - v) P = 3967$ pc/h
12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	3967	4700	No
$F_i F$			
$v = v - v$	3413	4700	No
$FO F R$			
v	554	2000	No
R			
v	0		(Equation 25-15 or 25-16)
$3 \text{ or } av34$			
Is v	> 2700 pc/h?	No	
$3 \text{ or } av34$			
Is v	> 1.5 v /2	No	
$3 \text{ or } av34$	12		
If yes, v =			(Equation 25-18)
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	3967	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 33.9$ pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.478$
S
Space mean speed in ramp influence area, $S = 54.0$ mph
R
Space mean speed in outer lanes, $S = N/A$ mph
0
Space mean speed for all vehicles, $S = 54.0$ mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/15/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Freeway Data

	Merge	
Type of analysis	2	
Number of lanes in freeway	65.0	mph
Free-flow speed on freeway	1720	vph
Volume on freeway		

On Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-flow speed on ramp	205	vph
Volume on ramp	500	ft
Length of first accel/decel lane		ft
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	170	vph
Volume on adjacent Ramp	Upstream	
Position of adjacent Ramp	Off	
Type of adjacent Ramp	2000	ft
Distance to adjacent Ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1720	205	170	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	478	57	47	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2007 239 198 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 2007 \text{ pc/h}$
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 2246 4700 No
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = (Equation 25-8)
 12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 2007 4400 No
 v 12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 19.7 pc/mi/ln
 R 12 A
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.323
 S
 Space mean speed in ramp influence area, S = 57.6 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 57.6 mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 2/15/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Existing Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 2925 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 255 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 475 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2925	255	475	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	813	71	132	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3413 298 554 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 3413 \text{ pc/h}$
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 3711 4700 No
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = (Equation 25-8)
 12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 3413 4400 No
 v 12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 31.1 pc/mi/ln
 R 12 A
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.445
 S
 Space mean speed in ramp influence area, S = 54.8 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 54.8 mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 2/15/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Union Road
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Existing Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 1925 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 130 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 245 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1925	130	245	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	535	36	68	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2246 152 286 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
 $v = v + (v - v) P = 2246$ pc/h
12 R F R FD

Capacity Checks

Actual Maximum LOS F?
v = v 2246 4700 No
F1 F
v = v - v 2094 4700 No
FO F R
v R 152 2000 No
v v 0 pc/h (Equation 25-15 or 25-16)
3 or av34
Is v v > 2700 pc/h? No
3 or av34
Is v v > 1.5 v /2 No
3 or av34 12
If yes, v = (Equation 25-18)
12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
v 12 2246 4600 No

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 19.1 pc/mi/in
R 12 D
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D = 0.442
S
Space mean speed in ramp influence area, S = 54.8 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 54.8 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/15/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3180 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 495 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 255 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3180	495	255	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	883	138	71	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3710 578 298 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
 $v = v + (v - v) P = 3710$ pc/h
12 R F R FD

Capacity Checks

Actual Maximum LOS F?
v = v 3710 4700 No
F1 F
v = v - v 3132 4700 No
FO F R
v R 578 2000 No
v v 0 pc/h (Equation 25-15 or 25-16)
3 or av34
Is v v > 2700 pc/h? No
3 or av34
Is v v > 1.5 v /2 No
3 or av34 12
If yes, v = (Equation 25-18)
12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
v 12 3710 4600 No

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 31.7 pc/mi/in
R 12 D
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, D = 0.480
S
Space mean speed in ramp influence area, S = 54.0 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 54.0 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/15/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 1795 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 245 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 130 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1795	245	130	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	499	68	36	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2094 286 152 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 2094 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
v FO 2380 4700 No
v v 0 pc/h (Equation 25-4 or 25-5)
Is v 3 or v av34 > 2700 pc/h? No
Is v 3 or v av34 > 1.5 v /2 No
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
v 12 2094 4400 No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.8 pc/mi/ln
R R A
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.328
S
Space mean speed in ramp influence area, S = 57.5 mph
R
Space mean speed in outer lanes, S = N/A mph
O
Space mean speed for all vehicles, S = 57.5 mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/15/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2685 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 255 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 495 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2685	255	495	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	746	71	138	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3133 298 578 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 3133 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
v FO 3431 4700 No
v v 0 pc/h (Equation 25-4 or 25-5)
Is v 3 or v av34 > 2700 pc/h? No
Is v 3 or v av34 > 1.5 v /2 No
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
v 12 3133 4400 No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 29.0 pc/mi/ln
R R A
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.407
S
Space mean speed in ramp influence area, S = 55.6 mph
R
Space mean speed in outer lanes, S = N/A mph
O
Space mean speed for all vehicles, S = 55.6 mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/15/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3165 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 270 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 395 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3165	270	395	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	879	75	110	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3693 315 461 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 3693$ pc/h
 12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	3693	4700	No
$F_i F$			
$v = v - v$	3378	4700	No
$F O F R$			
$v R$	315	2000	No
$v v$	0		(Equation 25-15 or 25-16)
3 or av34			
Is $v v$	> 2700 pc/h?	No	
3 or av34			
Is $v v$	> 1.5 v /2	No	
3 or av34	12		
If yes, v	=	(Equation 25-18)	
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	3693	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 31.5$ pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

	D = 0.456
Intermediate speed variable,	S
Space mean speed in ramp influence area,	S = 54.5 mph
Space mean speed in outer lanes,	R
Space mean speed for all vehicles,	S = N/A mph
	0
	S = 54.5 mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 2/15/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Union Road
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Existing Conditions
 Description: Stadium Center III

Freeway Data

	Diverge	
Type of analysis	2	
Number of lanes in freeway	65.0	mph
Free-flow speed on freeway	2405	vph
Volume on freeway		

Off Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-Flow speed on ramp	350	vph
Volume on ramp	500	ft
Length of first accel/decel lane		ft
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	165	vph
Volume on adjacent ramp	Downstream	
Position of adjacent ramp	On	
Type of adjacent ramp	2000	ft
Distance to adjacent ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2405	350	165	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	668	97	46	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2806 408 193 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 2806$ pc/h
 12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	2806	4700	No
$F_i F$			
$v = v - v$	2398	4700	No
$F O F R$			
$v R$	408	2000	No
$v v$	0		(Equation 25-15 or 25-16)
3 or av34			
Is $v v$	> 2700 pc/h?	No	
3 or av34			
Is $v v$	> 1.5 v /2	No	
3 or av34	12		
If yes, v	=	(Equation 25-18)	
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	2806	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 23.9$ pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

	D = 0.465
Intermediate speed variable,	S
Space mean speed in ramp influence area,	S = 54.3 mph
Space mean speed in outer lanes,	R
Space mean speed for all vehicles,	S = N/A mph
	0
	S = 54.3 mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 2/15/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Union Rd
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Existing Conditions
 Description: Stadium Center III

Freeway Data

	Merge	
Type of analysis	2	
Number of lanes in freeway	65.0	mph
Free-flow speed on freeway	2895	vph
Volume on freeway		

On Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-flow speed on ramp	395	vph
Volume on ramp	500	ft
Length of first accel/decel lane		ft
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	270	vph
Volume on adjacent Ramp	Upstream	
Position of adjacent Ramp	Off	
Type of adjacent Ramp	2000	ft
Distance to adjacent Ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2895	395	270	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	804	110	75	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3378 461 315 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 3378 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
3839 4700 No
FO
v v
3 or v av34 0 pc/h (Equation 25-4 or 25-5)
Is v v
3 or v av34 > 2700 pc/h? No
Is v v
3 or v av34 > 1.5 v /2 No
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
3378 4400 No
v
12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 32.1 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.467
S
Space mean speed in ramp influence area, S = 54.3 mph
R
Space mean speed in outer lanes, S = N/A mph
O
Space mean speed for all vehicles, S = 54.3 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/15/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2055 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 165 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 350 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2055	165	350	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	571	46	97	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2398 193 408 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 2398 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
2591 4700 No
FO
v v
3 or v av34 0 pc/h (Equation 25-4 or 25-5)
Is v v
3 or v av34 > 2700 pc/h? No
Is v v
3 or v av34 > 1.5 v /2 No
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
2398 4400 No
v
12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 22.5 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.338
S
Space mean speed in ramp influence area, S = 57.2 mph
R
Space mean speed in outer lanes, S = N/A mph
O
Space mean speed for all vehicles, S = 57.2 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 2/15/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Existing Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3290 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 265 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 545 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3290	265	545	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	914	74	151	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3838 309 636 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 3838$ pc/h
 12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	3838	4700	No
$F1 = F$			
$v = v - v$	3529	4700	No
$FO = F R$			
$v R$	309	2000	No
$v v$	0		
3 or av34			(Equation 25-15 or 25-16)
Is v v	> 2700 pc/h?	No	
3 or av34			
Is v v	> 1.5 v /2	No	
3 or av34	12		
If yes, v	=		(Equation 25-18)
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	3838	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 32.8$ pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.456$
 S
 Space mean speed in ramp influence area, $S = 54.5$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 0
 Space mean speed for all vehicles, $S = 54.5$ mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 2/15/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Existing Conditions
 Description: Stadium Center III

Freeway Data

	Diverge	
Type of analysis	2	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2220	vph

Off Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-flow speed on ramp	230	vph
Volume on ramp	500	ft
Length of first accel/decel lane		ft
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	210	vph
Volume on adjacent ramp	Downstream	
Position of adjacent ramp	On	
Type of adjacent ramp	2000	ft
Distance to adjacent ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2220	230	210	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	617	64	58	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2590 268 245 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 2590$ pc/h
 12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	2590	4700	No
$F1 = F$			
$v = v - v$	2322	4700	No
$FO = F R$			
$v R$	268	2000	No
$v v$	0		
3 or av34			(Equation 25-15 or 25-16)
Is v v	> 2700 pc/h?	No	
3 or av34			
Is v v	> 1.5 v /2	No	
3 or av34	12		
If yes, v	=		(Equation 25-18)
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	2590	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 22.0$ pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.452$
 S
 Space mean speed in ramp influence area, $S = 54.6$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 0
 Space mean speed for all vehicles, $S = 54.6$ mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 2/15/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Existing Conditions
 Description: Stadium Center III

Freeway Data

	Merge	
Type of analysis	2	
Number of lanes in freeway	65.0	mph
Free-flow speed on freeway	3025	vph
Volume on freeway		

On Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-flow speed on ramp	545	vph
Volume on ramp	500	ft
Length of first accel/decel lane		ft
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	265	vph
Volume on adjacent Ramp	Upstream	
Position of adjacent Ramp	Off	
Type of adjacent Ramp	2000	ft
Distance to adjacent Ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3025	545	265	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	840	151	74	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3529 636 309 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 3529$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 4165 4700 No
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 12
 If yes, v = (Equation 25-8)
 12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 3529 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 34.5$ pc/mi/ln
 R R A
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.537
 S
 Space mean speed in ramp influence area, S = 52.6 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 52.6 mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 2/15/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Existing Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 1990 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 210 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 230 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1990	210	230	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	553	58	64	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2322 245 268 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 2322$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 2567 4700 No
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 12
 If yes, v = (Equation 25-8)
 12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 2322 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 22.2$ pc/mi/ln
 R R A
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.337
 S
 Space mean speed in ramp influence area, S = 57.3 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 57.3 mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 1932 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 227 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 254 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1932	227	254	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	537	63	71	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2254 265 296 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 2254$ pc/h
 12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	2254	4700	No
$F_i = F$	1989	4700	No
$v = v - v$	265	2000	No
$FO = F R$			
$v R$			
$v = v$	0		(Equation 25-15 or 25-16)
$3 \text{ or } av34$			
Is $v = v$	> 2700 pc/h?	No	
$3 \text{ or } av34$			
Is $v = v$	> 1.5 v /2	No	
$3 \text{ or } av34$	12		
If yes, v =		(Equation 25-18)	
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	2254	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 19.1$ pc/mi/in
 R 12 D
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.452$
 S
 Space mean speed in ramp influence area, $S = 54.6$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 0
 Space mean speed for all vehicles, $S = 54.6$ mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E+P Conditions
 Description: Stadium Center III

Freeway Data

	Diverge	
Type of analysis	2	
Number of lanes in freeway	65.0	mph
Free-flow speed on freeway	3482	vph
Volume on freeway		

Off Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-flow speed on ramp	596	vph
Volume on ramp	500	ft
Length of first accel/decel lane		ft
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	376	vph
Volume on adjacent ramp	Downstream	
Position of adjacent ramp	On	
Type of adjacent ramp	2000	ft
Distance to adjacent ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3482	596	376	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	967	166	104	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 4062 695 439 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 4062$ pc/h
 12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	4062	4700	No
$F_i = F$	3367	4700	No
$v = v - v$	695	2000	No
$FO = F R$			
$v R$			
$v = v$	0		(Equation 25-15 or 25-16)
$3 \text{ or } av34$			
Is $v = v$	> 2700 pc/h?	No	
$3 \text{ or } av34$			
Is $v = v$	> 1.5 v /2	No	
$3 \text{ or } av34$	12		
If yes, v =		(Equation 25-18)	
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	4062	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 34.7$ pc/mi/in
 R 12 D
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.491$
 S
 Space mean speed in ramp influence area, $S = 53.7$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 0
 Space mean speed for all vehicles, $S = 53.7$ mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E+P Conditions
 Description: Stadium Center III

Freeway Data

	Merge	
Type of analysis	2	
Number of lanes in freeway	65.0	mph
Free-flow speed on freeway	1705	vph
Volume on freeway		

On Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-flow speed on ramp	254	vph
Volume on ramp	500	ft
Length of first accel/decel lane		ft
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	227	vph
Volume on adjacent Ramp	Upstream	
Position of adjacent Ramp	Off	
Type of adjacent Ramp	2000	ft
Distance to adjacent Ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1705	254	227	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	474	71	63	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 1989 296 265 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 1989$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 2285 4700 No
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 1989 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.0+$ pc/mi/ln
 R R 12 A
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.324
 S
 Space mean speed in ramp influence area, S = 57.5 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 O
 Space mean speed for all vehicles, S = 57.5 mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 2886 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 376 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 596 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2886	376	596	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	802	104	166	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3367 439 695 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 3367$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 3806 4700 No
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 3367 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 31.8$ pc/mi/ln
 R R 12 A
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.461
 S
 Space mean speed in ramp influence area, S = 54.4 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 O
 Space mean speed for all vehicles, S = 54.4 mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Union Road
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 1959 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 138 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 248 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1959	138	248	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	544	38	69	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2286 161 289 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 2286$ pc/h
 12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	2286	4700	No
$F_i = F$			
$v = v - v$	2125	4700	No
$F_O = F R$			
$v R$	161	2000	No
$v v$	0		
3 or av34			(Equation 25-15 or 25-16)
Is $v v$	> 2700 pc/h?	No	
3 or av34			
Is $v v$	> 1.5 v /2	No	
3 or av34	12		
If yes, v =		(Equation 25-18)	
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	2286	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 19.4$ pc/mi/ln
 R 12 D

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

Speed Estimation

Intermediate speed variable, $D = 0.442$
 S
 Space mean speed in ramp influence area, $S = 54.8$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 O
 Space mean speed for all vehicles, $S = 54.8$ mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Union Road
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E-P Conditions
 Description: Stadium Center III

Freeway Data

	Diverge	
Type of analysis	2	
Number of lanes in freeway		
Free-flow speed on freeway	65.0	mph
Volume on freeway	3262	vph

Off Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-flow speed on ramp	515	vph
Volume on ramp	500	ft
Length of first accel/decel lane		
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	262	vph
Volume on adjacent ramp	Downstream	
Position of adjacent ramp	On	
Type of adjacent ramp	2000	ft
Distance to adjacent ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3262	515	262	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	906	143	73	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:				
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3806 601 306 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 3806$ pc/h
 12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	3806	4700	No
$F_i = F$			
$v = v - v$	3205	4700	No
$F_O = F R$			
$v R$	601	2000	No
$v v$	0		
3 or av34			(Equation 25-15 or 25-16)
Is $v v$	> 2700 pc/h?	No	
3 or av34			
Is $v v$	> 1.5 v /2	No	
3 or av34	12		
If yes, v =		(Equation 25-18)	
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	3806	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 32.5$ pc/mi/ln
 R 12 D

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

Speed Estimation

Intermediate speed variable, $D = 0.482$
 S
 Space mean speed in ramp influence area, $S = 53.9$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 O
 Space mean speed for all vehicles, $S = 53.9$ mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Union Rd
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E-P Conditions
 Description: Stadium Center III

Freeway Data

	Merge	
Type of analysis	2	
Number of lanes in freeway		
Free-flow speed on freeway	65.0	mph
Volume on freeway	1821	vph

On Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-flow speed on ramp	248	vph
Volume on ramp	500	ft
Length of first accel/decel lane		
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	138	vph
Volume on adjacent Ramp	Upstream	
Position of adjacent Ramp	Off	
Type of adjacent Ramp	2000	ft
Distance to adjacent Ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1821	248	138	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	506	69	38	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:				
Grade	Level	Level	Level	
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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2125 289 161 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 2125 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
v FO 2414 4700 No
v v 0 pc/h (Equation 25-4 or 25-5)
3 or v av34
Is v v > 2700 pc/h? No
3 or v av34
Is v v > 1.5 v /2 No
3 or v av34 12
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
v 12 2125 4400 No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 21.0 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.330
S
Space mean speed in ramp influence area, S = 57.4 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 57.4 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2747 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 262 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 515 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2747	262	515	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	763	73	143	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3205 306 601 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 3205 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
v FO 3511 4700 No
v v 0 pc/h (Equation 25-4 or 25-5)
3 or v av34
Is v v > 2700 pc/h? No
3 or v av34
Is v v > 1.5 v /2 No
3 or v av34 12
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
v 12 3205 4400 No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 29.6 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.417
S
Space mean speed in ramp influence area, S = 55.4 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 55.4 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3198 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 273 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 405 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3198	273	405	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	888	76	113	v
Trucks and buses	10	10	10	%
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	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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3731 319 473 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 3731$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 v = v 3731 4700 No
 $F_i = F$
 $v = v - v$ 3412 4700 No
 $F_O = F R$
 v 319 2000 No
 R
 $v = v$ 0 pc/h (Equation 25-15 or 25-16)
 3 or av34
 Is v v > 2700 pc/h? No
 3 or av34
 Is v v > 1.5 v /2 No
 3 or av34 12
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 v 12 3731 4600 No

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 31.8 pc/mi/in
 R 12 D
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, D = 0.457
 S
 Space mean speed in ramp influence area, S = 54.5 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 54.5 mph

Phone:
 E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Union Road
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 2471 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 357 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 189 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2471	357	189	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	686	99	53	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:				
Grade	0.00 %	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	0.00 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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2883 417 221 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 2883$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 v = v 2883 4700 No
 $F_i = F$
 $v = v - v$ 2466 4700 No
 $F_O = F R$
 v 417 2000 No
 R
 $v = v$ 0 pc/h (Equation 25-15 or 25-16)
 3 or av34
 Is v v > 2700 pc/h? No
 3 or av34
 Is v v > 1.5 v /2 No
 3 or av34 12
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 v 12 2883 4600 No

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 24.5 pc/mi/in
 R 12 D
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D = 0.466
 S
 Space mean speed in ramp influence area, S = 54.3 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 54.3 mph

Phone:
 E-mail:

Fax:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Union Rd
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 2925 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 405 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 273 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2925	405	273	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	813	113	76	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:				
Grade	%	%	%	%
Length	mi	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3413 473 319 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 3413 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
v FO 3886 4700 No
v v 0 pc/h (Equation 25-4 or 25-5)
Is 3 or v av34 > 2700 pc/h? No
Is 3 or v av34 > 1.5 v /2 No
If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
v 12 3413 4400 No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 32.4 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.476
S
Space mean speed in ramp influence area, S = 54.1 mph
R
Space mean speed in outer lanes, S = N/A mph
O
Space mean speed for all vehicles, S = 54.1 mph

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2114 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 184 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 357 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2114	184	357	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	587	51	99	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

HCS+: Ramps and Ramp Junctions Release 5.21

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: E+P Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3330 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 340 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 616 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3330	340	616	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	925	94	171	v
Trucks and buses	10	10	10	%
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	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2466 215 417 pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 2466 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
v FO 2681 4700 No
v v 0 pc/h (Equation 25-4 or 25-5)
Is 3 or v av34 > 2700 pc/h? No
Is 3 or v av34 > 1.5 v /2 No
If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
v 12 2466 4400 No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 23.2 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.343
S
Space mean speed in ramp influence area, S = 57.1 mph
R
Space mean speed in outer lanes, S = N/A mph
O
Space mean speed for all vehicles, S = 57.1 mph

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3885 397 719 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 3885$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 v = v 3885 4700 No
 Fi F
 $v = v - v$ 3488 4700 No
 FO F R
 v 397 2000 No
 R
 v 0 pc/h (Equation 25-15 or 25-16)
 3 or av34
 Is v v > 2700 pc/h? No
 3 or av34
 Is v v > 1.5 v /2 No
 3 or av34 12
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 v 3885 4600 No
 12

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 33.2 pc/mi/in
 R 12 D
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, D = 0.464
 S
 Space mean speed in ramp influence area, S = 54.3 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 54.3 mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 2298 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 335 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 324 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2298	335	324	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	638	93	90	v
Trucks and buses	10	10	10	%
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	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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2681 391 378 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 2681$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 v = v 2681 4700 No
 Fi F
 $v = v - v$ 2290 4700 No
 FO F R
 v 391 2000 No
 R
 v 0 pc/h (Equation 25-15 or 25-16)
 3 or av34
 Is v v > 2700 pc/h? No
 3 or av34
 Is v v > 1.5 v /2 No
 3 or av34 12
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 v 2681 4600 No
 12

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 22.8 pc/mi/in
 R 12 D
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D = 0.463
 S
 Space mean speed in ramp influence area, S = 54.3 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 54.3 mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 2990 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 616 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 340 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2990	616	340	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	831	171	94	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3488 719 397 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 3488$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 4207 4700 No
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 3488 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v}{R} + 0.0078 \frac{v}{12} - 0.00627 \frac{L}{A} = 34.8$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $M = 0.548$
 S
 Space mean speed in ramp influence area, $S = 52.4$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 O
 Space mean speed for all vehicles, $S = 52.4$ mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: E+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 1963 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 324 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 335 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1963	324	335	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	545	90	93	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2290 378 391 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 2290$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 2668 4700 No
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 2290 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v}{R} + 0.0078 \frac{v}{12} - 0.00627 \frac{L}{A} = 23.0$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.342$
 S
 Space mean speed in ramp influence area, $S = 57.1$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 O
 Space mean speed for all vehicles, $S = 57.1$ mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 3470 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 885 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 445 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3470	885	445	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	964	246	124	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 4048 1033 519 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 4048$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 v = v 4048 4700 No
 $F_i = F$
 $v = v - v$ 3015 4700 No
 $FO = F R$
 v 1033 2000 No
 R
 $v = v$ 0 pc/h (Equation 25-15 or 25-16)
 3 or av34
 Is v v > 2700 pc/h? No
 3 or av34
 Is v v > 1.5 v /2 No
 3 or av34 12
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 v 12 4048 4600 No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 34.6$ pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.521$
 S
 Space mean speed in ramp influence area, $S = 53.0$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 0
 Space mean speed for all vehicles, $S = 53.0$ mph

Phone:
 E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 5810 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 1445 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 870 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5810	1445	870	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1614	401	242	v
Trucks and buses	10	10	10	%
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	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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 6778 1686 1015 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 6778$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 v = v 6778 4700 Yes
 $F_i = F$
 $v = v - v$ 5092 4700 Yes
 $FO = F R$
 v 1686 2000 No
 R
 $v = v$ 0 pc/h (Equation 25-15 or 25-16)
 3 or av34
 Is v v > 2700 pc/h? No
 3 or av34
 Is v v > 1.5 v /2 No
 3 or av34 12
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 v 12 6778 4600 No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 58.0$ pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $D = 0.580$
 S
 Space mean speed in ramp influence area, $S = 51.7$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 0
 Space mean speed for all vehicles, $S = 51.7$ mph

Phone:
 E-mail:

Fax:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 2585 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 445 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 885 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2585	445	885	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	718	124	246	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3016 519 1033 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 3016$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 3535 4700 No
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 3016 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 29.7$ pc/mi/ln
 R R 12 A
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.420
 S
 Space mean speed in ramp influence area, S = 55.3 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 55.3 mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 4365 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 870 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 1445 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4365	870	1445	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1213	242	401	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 5093 1015 1686 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 5093$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 6108 4700 Yes
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 5093 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 49.5$ pc/mi/ln
 R R 12 A
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M = 2.039
 S
 Space mean speed in ramp influence area, S = 18.1 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 18.1 mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Union Road
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 3030 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 620 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 305 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3030	620	305	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	842	172	85	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3535 723 356 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 3535$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 v = v 3535 4700 No
 Fi F
 $v = v - v$ 2812 4700 No
 FO F R
 v 723 2000 No
 R
 v v 0 pc/h (Equation 25-15 or 25-16)
 3 or av34
 Is v v > 2700 pc/h? No
 3 or av34
 Is v v > 1.5 v /2 No
 3 or av34 12
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 v 12 3535 4600 No

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 30.2 pc/mi/in
 R 12 D
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, D = 0.493
 S
 Space mean speed in ramp influence area, S = 53.7 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 53.7 mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Union Road
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 5235 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 1405 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 480 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5235	1405	480	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1454	390	133	v
Trucks and buses	10	10	10	%
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	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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 6108 1639 560 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 6108$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 v = v 6108 4700 Yes
 Fi F
 $v = v - v$ 4469 4700 No
 FO F R
 v 1639 2000 No
 R
 v v 0 pc/h (Equation 25-15 or 25-16)
 3 or av34
 Is v v > 2700 pc/h? No
 3 or av34
 Is v v > 1.5 v /2 No
 3 or av34 12
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 v 12 6108 4600 No

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 52.3 pc/mi/in
 R 12 D
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, D = 0.576
 S
 Space mean speed in ramp influence area, S = 51.8 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 51.8 mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Union Rd
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 2410 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 305 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 620 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2410	305	620	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	669	85	172	v
Trucks and buses	10	10	10	%
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	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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2812 356 723 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 2812$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 3168 4700 No
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 2812 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v}{R} + 0.0078 \frac{v}{R} - 0.00627 \frac{L}{A} = 26.9$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.379$
 S
 Space mean speed in ramp influence area, $S = 56.3$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 O
 Space mean speed for all vehicles, $S = 56.3$ mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Union Rd
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 3830 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 480 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 1405 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3830	480	1405	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1064	133	390	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 4468 560 1639 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 4468$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 5028 4700 Yes
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 4468 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v}{R} + 0.0078 \frac{v}{R} - 0.00627 \frac{L}{A} = 41.3$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $M = 0.881$
 S
 Space mean speed in ramp influence area, $S = 44.7$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 O
 Space mean speed for all vehicles, $S = 44.7$ mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Union Road
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 5350 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 415 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 1065 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5350	415	1065	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1486	115	296	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 6242 484 1243 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 6242$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 6242 4700 Yes
 $v = v$
 $F_i F$
 $v = v - v$
 $F O F R$
 5758 4700 Yes
 v
 R
 484 2000 No
 v
 3 or $av34$ 0 pc/h (Equation 25-15 or 25-16)
 v
 3 or $av34$
 Is v v > 2700 pc/h? No
 3 or $av34$
 Is v v > 1.5 v /2 No
 3 or $av34$ 12
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 6242 4600 No
 v 12

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 53.4 pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, D = 0.472
 S
 Space mean speed in ramp influence area, S = 54.2 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 54.2 mph

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3284 554 846 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 3284$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 3284 4700 No
 $v = v$
 $F_i F$
 $v = v - v$
 $F O F R$
 2730 4700 No
 v
 R
 554 2000 No
 v
 3 or $av34$ 0 pc/h (Equation 25-15 or 25-16)
 v
 3 or $av34$
 Is v v > 2700 pc/h? No
 3 or $av34$
 Is v v > 1.5 v /2 No
 3 or $av34$ 12
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 3284 4600 No
 v 12

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 28.0- pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D = 0.478
 S
 Space mean speed in ramp influence area, S = 54.0 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 54.0 mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Union Road
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 2815 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 475 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 725 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2815	475	725	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	782	132	201	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:				
Grade	0.00 %	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	0.00 mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Union Rd
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 4935 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 1065 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 415 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4935	1065	415	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1371	296	115	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:				
Grade	%	%	%	%
Length	mi	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 5758 1243 484 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 5758 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
7001 4700 Yes
v FO
v v 0 pc/h (Equation 25-4 or 25-5)
3 or av34
Is v v > 2700 pc/h? No
3 or av34
Is v v > 1.5 v /2 No
3 or av34 12
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
5758 4400 No
v 12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 56.4 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M = 4.567
S
Space mean speed in ramp influence area, S = -40.0 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2340 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 725 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 475 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2340	725	475	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	650	201	132	v
Trucks and buses	10	10	10	%
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	

HCS+: Ramps and Ramp Junctions Release 5.21

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2730 846 554 pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 2730 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
3576 4700 No
v FO
v v 0 pc/h (Equation 25-4 or 25-5)
3 or av34
Is v v > 2700 pc/h? No
3 or av34
Is v v > 1.5 v /2 No
3 or av34 12
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
2730 4400 No
v 12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 29.8 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.425
S
Space mean speed in ramp influence area, S = 55.2 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 55.2 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 6000 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 1100 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 1215 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6000	1100	1215	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1667	306	338	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	0.00	0.00	%
Length	0.00	0.00	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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 7000 1283 1418 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 7000$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 7000 4700 Yes
 $v = v$
 $F_i F$
 $v = v - v$
 $FO F R$
 5717 4700 Yes
 v
 R
 1283 2000 No
 v
 v
 0 pc/h (Equation 25-15 or 25-16)
 $3 \text{ or } av34$
 Is v v > 2700 pc/h? No
 $3 \text{ or } av34$
 Is v v $> 1.5 v / 2$ No
 $3 \text{ or } av34$
 If yes, $v =$
 12A (Equation 25-18)

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 7000 4600 No
 12

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 60.0$ pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $D = 0.543$
 S
 Space mean speed in ramp influence area, $S = 52.5$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 0
 Space mean speed for all vehicles, $S = 52.5$ mph

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3576 712 1406 pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 3576$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 3576 4700 No
 $v = v$
 $F_i F$
 $v = v - v$
 $FO F R$
 2864 4700 No
 v
 R
 712 2000 No
 v
 v
 0 pc/h (Equation 25-15 or 25-16)
 $3 \text{ or } av34$
 Is v v > 2700 pc/h? No
 $3 \text{ or } av34$
 Is v v $> 1.5 v / 2$ No
 $3 \text{ or } av34$
 If yes, $v =$
 12A (Equation 25-18)

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 3576 4600 No
 12

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 30.5$ pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.492$
 S
 Space mean speed in ramp influence area, $S = 53.7$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 0
 Space mean speed for all vehicles, $S = 53.7$ mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 3065 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 610 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 1205 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3065	610	1205	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	851	169	335	v
Trucks and buses	10	10	10	%
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	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

HCS+: Ramps and Ramp Junctions Release 5.21

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: Cumulative Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 4900 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 1215 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 1100 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4900	1215	1100	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1361	338	306	v
Trucks and buses	10	10	10	%
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	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 5717 1418 1283 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 5717 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
7135 4700 Yes
FO
v 3 or av34 0 pc/h (Equation 25-4 or 25-5)
Is v v > 2700 pc/h? No
3 or av34
Is v v > 1.5 v /2 No
3 or av34 12
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
v 5717 4400 No
12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 57.3 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M = 5.181
S
Space mean speed in ramp influence area, S = -54.2 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Westbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: Cumulative Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2455 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 1205 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 610 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2455	1205	610	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	682	335	169	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2864 1406 712 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 2864 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
4270 4700 No
FO
v 3 or av34 0 pc/h (Equation 25-4 or 25-5)
Is v v > 2700 pc/h? No
3 or av34
Is v v > 1.5 v /2 No
3 or av34 12
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
v 2864 4400 No
12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 35.0- pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.565
S
Space mean speed in ramp influence area, S = 52.0 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 52.0 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3504 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 936 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 493 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3504	936	493	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	973	260	137	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	0.00	0.00	%
Length	0.00	0.00	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 4088 1092 575 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
 $v = v + (v - v) P = 4088$ pc/h
12 R F R FD

Capacity Checks

Actual Maximum LOS F?
v = v 4088 4700 No
Fi F
v = v - v 2996 4700 No
FO F R
v 1092 2000 No
R
v v 0 pc/h (Equation 25-15 or 25-16)
3 or av34
Is v v > 2700 pc/h? No
3 or av34
Is v v > 1.5 v /2 No
3 or av34 12
If yes, v = (Equation 25-18)
12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
v 12 4088 4600 No

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 34.9 pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, D = 0.526
S
Space mean speed in ramp influence area, S = 52.9 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 52.9 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 5875 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 1548 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 983 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5875	1548	983	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1632	430	273	v
Trucks and buses	10	10	10	%
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	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 6854 1806 1147 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
 $v = v + (v - v) P = 6854$ pc/h
12 R F R FD

Capacity Checks

Actual Maximum LOS F?
v = v 6854 4700 Yes
Fi F
v = v - v 5048 4700 Yes
FO F R
v 1806 2000 No
R
v v 0 pc/h (Equation 25-15 or 25-16)
3 or av34
Is v v > 2700 pc/h? No
3 or av34
Is v v > 1.5 v /2 No
3 or av34 12
If yes, v = (Equation 25-18)
12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
v 12 6854 4600 No

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 58.7 pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, D = 0.591
S
Space mean speed in ramp influence area, S = 51.4 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 51.4 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2568 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 493 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 936 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2568	493	936	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	713	137	260	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 2996 575 1092 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 2996 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
3571 4700 No
FO
v v
3 or av34 0 pc/h (Equation 25-4 or 25-5)
Is v v
3 or av34 > 2700 pc/h? No
Is v v
3 or av34 > 1.5 v /2 No
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
2996 4400 No
v
12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 29.9 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.425
S
Space mean speed in ramp influence area, S = 55.2 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 55.2 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Airport Way
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 4327 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 983 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 1548 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4327	983	1548	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1202	273	430	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 5048 1147 1806 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 5048 pc/h
12 F FM

Capacity Checks

Actual Maximum LOS F?
6195 4700 Yes
FO
v v
3 or av34 0 pc/h (Equation 25-4 or 25-5)
Is v v
3 or av34 > 2700 pc/h? No
Is v v
3 or av34 > 1.5 v /2 No
If yes, v = (Equation 25-8)
12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
5048 4400 No
v
12

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 50.1 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M = 2.198
S
Space mean speed in ramp influence area, S = 14.4 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 14.4 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 3061 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 634 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 307 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3061	634	307	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	850	176	85	v
Trucks and buses	10	10	10	%
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	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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 3571 740 358 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
v = v + (v - v) P = 3571 pc/h
12 R F R FD

Capacity Checks

Actual Maximum LOS F?
v = v 3571 4700 No
F_i F
v = v - v 2831 4700 No
F_O F R
v 740 2000 No
R
v v 0 pc/h (Equation 25-15 or 25-16)
3 or av34
Is v v > 2700 pc/h? No
3 or av34
Is v v > 1.5 v /2 No
3 or av34 12
If yes, v = (Equation 25-18)
12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
v 12 3571 4600 No

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 30.5 pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, D = 0.495
S
Space mean speed in ramp influence area, S = 53.6 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 53.6 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: PM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Road
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 5310 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 1439 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent ramp 484 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5310	1439	484	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1475	400	134	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
Driver population factor, fP 1.00 1.00 1.00
Flow rate, vp 6195 1679 565 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
v = v + (v - v) P = 6195 pc/h
12 R F R FD

Capacity Checks

Actual Maximum LOS F?
v = v 6195 4700 Yes
F_i F
v = v - v 4516 4700 No
F_O F R
v 1679 2000 No
R
v v 0 pc/h (Equation 25-15 or 25-16)
3 or av34
Is v v > 2700 pc/h? No
3 or av34
Is v v > 1.5 v /2 No
3 or av34 12
If yes, v = (Equation 25-18)
12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
v 12 6195 4600 No

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 53.0 pc/mi/ln
R 12 D
Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, D = 0.579
S
Space mean speed in ramp influence area, S = 51.7 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 51.7 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst: Fehr & Peers
Agency/Co.: Fehr & Peers
Date performed: 5/24/2007
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR 120 Eastbound
Junction: Union Rd
Jurisdiction: Manteca/San Joaquin
Analysis Year: C+P Conditions
Description: Stadium Center III

Freeway Data

Type of analysis Merge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 2427 vph

On Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-flow speed on ramp 35.0 mph
Volume on ramp 307 vph
Length of first accel/decel lane 500 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
Volume on adjacent Ramp 634 vph
Position of adjacent Ramp Upstream
Type of adjacent Ramp Off
Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2427	307	634	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	674	85	176	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2832 358 740 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 2832$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 3190 4700 No
 v FO
 v 3 or av_{34} 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or av_{34} > 2700 pc/h? No
 Is v 3 or av_{34} > 1.5 v /2 No
 If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 2832 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 27.1$ pc/mi/ln
 R R 12 A

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

Speed Estimation

Intermediate speed variable, M = 0.381
 S
 Space mean speed in ramp influence area, S = 56.2 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 56.2 mph

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 4516 565 1679 pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 4516$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 5081 4700 Yes
 v FO
 v 3 or av_{34} 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or av_{34} > 2700 pc/h? No
 Is v 3 or av_{34} > 1.5 v /2 No
 If yes, v = 12A (Equation 25-8)

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 4516 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 41.7$ pc/mi/ln
 R R 12 A

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

Speed Estimation

Intermediate speed variable, M = 0.914
 S
 Space mean speed in ramp influence area, S = 44.0 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 44.0 mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Eastbound
 Junction: Union Rd
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: C+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 3871 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 484 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 1439 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3871	484	1439	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1075	134	400	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

HCS+: Ramps and Ramp Junctions Release 5.21

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Union Road
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: C+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 5372 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 417 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 1082 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5372	417	1082	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1492	116	301	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	0.00	0.00	%
Length	0.00	0.00	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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 6267 487 1262 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 6267$ pc/h
 12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	6267	4700	Yes
$F_i F$	5780	4700	Yes
$v = v - v$	487	2000	No
$F O F R$			
$v R$	0		
$v v$			(Equation 25-15 or 25-16)
3 or av34			
Is $v v$	> 2700 pc/h?	No	
3 or av34			
Is $v v$	> 1.5 v /2	No	
3 or av34	12		
If yes, v =			(Equation 25-18)
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	6267	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 53.6$ pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $D = 0.472$
 S
 Space mean speed in ramp influence area, $S = 54.1$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 0
 Space mean speed for all vehicles, $S = 54.1$ mph

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Union Road
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: C+P Conditions
 Description: Stadium Center III

Freeway Data

	Diverge	
Type of analysis	2	
Number of lanes in freeway	65.0	mph
Free-flow speed on freeway	2857	vph
Volume on freeway		

Off Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-Flow speed on ramp	479	vph
Volume on ramp	500	ft
Length of first accel/decel lane		ft
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	725	vph
Volume on adjacent ramp	Downstream	
Position of adjacent ramp	On	
Type of adjacent ramp	2000	ft
Distance to adjacent ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2857	479	725	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	794	133	201	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:				
Grade	Level	Level	Level	
Length	0.00 %	0.00 %	0.00 %	%
Trucks and buses PCE, ET	0.00 mi	0.00 mi	0.00 mi	mi
Recreational vehicle PCE, ER	1.5	1.5	1.5	
	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3333 559 846 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 3333$ pc/h
 12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	3333	4700	No
$F_i F$	2774	4700	No
$v = v - v$	559	2000	No
$F O F R$			
$v R$	0		
$v v$			(Equation 25-15 or 25-16)
3 or av34			
Is $v v$	> 2700 pc/h?	No	
3 or av34			
Is $v v$	> 1.5 v /2	No	
3 or av34	12		
If yes, v =			(Equation 25-18)
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	3333	4600	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 28.4$ pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.478$
 S
 Space mean speed in ramp influence area, $S = 54.0$ mph
 R
 Space mean speed in outer lanes, $S = N/A$ mph
 0
 Space mean speed for all vehicles, $S = 54.0$ mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Union Rd
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: C+P Conditions
 Description: Stadium Center III

Freeway Data

	Merge	
Type of analysis	2	
Number of lanes in freeway	65.0	mph
Free-flow speed on freeway	4955	vph
Volume on freeway		

On Ramp Data

	Right	
Side of freeway	1	
Number of lanes in ramp	35.0	mph
Free-flow speed on ramp	1082	vph
Volume on ramp	500	ft
Length of first accel/decel lane		ft
Length of second accel/decel lane		

Adjacent Ramp Data (if one exists)

	Yes	
Does adjacent ramp exist?	417	vph
Volume on adjacent Ramp	Upstream	
Position of adjacent Ramp	Off	
Type of adjacent Ramp	2000	ft
Distance to adjacent Ramp		

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4955	1082	417	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1376	301	116	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:				
Grade	Level	Level	Level	
Length	0.00 %	0.00 %	0.00 %	%
Trucks and buses PCE, ET	0.00 mi	0.00 mi	0.00 mi	mi
Recreational vehicle PCE, ER	1.5	1.5	1.5	
	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 5781 1262 487 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 5781$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 7043 4700 Yes
 v FO
 v 3 or v 0 pc/h (Equation 25-4 or 25-5)
 3 or v 34
 Is v 3 or v 34 > 2700 pc/h? No
 Is v 3 or v 34 > 1.5 v /2 No
 12
 If yes, v = (Equation 25-8)
 12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 5781 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 56.7$ pc/mi/ln
 R R 12 A
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M = 4.751
 S
 Space mean speed in ramp influence area, S = -44.3 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = mph

Heavy vehicle adjustment, fHV 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2774 884 559 pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v \left(\frac{P}{F} \right) = 2774$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 3658 4700 No
 v FO
 v 3 or v 0 pc/h (Equation 25-4 or 25-5)
 3 or v 34
 Is v 3 or v 34 > 2700 pc/h? No
 Is v 3 or v 34 > 1.5 v /2 No
 12
 If yes, v = (Equation 25-8)
 12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 2774 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 30.5$ pc/mi/ln
 R R 12 A
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.437
 S
 Space mean speed in ramp influence area, S = 54.9 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 54.9 mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Union Rd
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: C+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 2378 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 758 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 479 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2378	758	479	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	661	211	133	v
Trucks and buses	10	10	10	%
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	

HCS+: Ramps and Ramp Junctions Release 5.21

Phone: Fax:
 E-mail:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: C+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 6037 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 1166 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 1322 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6037	1166	1322	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1677	324	367	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 7043 1360 1542 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 7043$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 7043 4700 Yes
 $v = v$
 $F_i F$
 $v = v - v$
 $F O F R$
 5683 4700 Yes
 $v R$
 1360 2000 No
 $v v$
 0 pc/h (Equation 25-15 or 25-16)
 $3 \text{ or } av34$
 $v v$
 $3 \text{ or } av34$
 $v v$
 $3 \text{ or } av34$
 12
 Is $v v$ > 2700 pc/h? No
 Is $v v$ > 1.5 v /2 No
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 7043 4600 No
 v 12

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 60.3 pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, D = 0.550
 S
 Space mean speed in ramp influence area, S = 52.3 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 52.3 mph

Phone:
 E-mail:

Fax:

Diverge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: PM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: C+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Diverge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 3136 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 702 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent ramp 1294 vph
 Position of adjacent ramp Downstream
 Type of adjacent ramp On
 Distance to adjacent ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3136	702	1294	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	871	195	359	v
Trucks and buses	10	10	10	%
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	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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 3659 819 1510 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v = v + (v - v) P = 3659$ pc/h
 12 R F R FD

Capacity Checks

Actual Maximum LOS F?
 3659 4700 No
 $v = v$
 $F_i F$
 $v = v - v$
 $F O F R$
 2840 4700 No
 $v R$
 819 2000 No
 $v v$
 0 pc/h (Equation 25-15 or 25-16)
 $3 \text{ or } av34$
 $v v$
 $3 \text{ or } av34$
 $v v$
 $3 \text{ or } av34$
 12
 Is $v v$ > 2700 pc/h? No
 Is $v v$ > 1.5 v /2 No
 If yes, v = (Equation 25-18)
 12A

Flow Entering Diverge Influence Area

Actual Max Desirable Violation?
 3659 4600 No
 v 12

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v - 0.009 L = 31.2 pc/mi/ln
 R 12 D
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, D = 0.502
 S
 Space mean speed in ramp influence area, S = 53.5 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 53.5 mph

Phone:
 E-mail:

Fax:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: AM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: C+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 4871 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 1322 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 1166 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4871	1322	1166	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1353	367	324	v
Trucks and buses	10	10	10	%
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	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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 5683 1542 1360 pcph

HCS+: Ramps and Ramp Junctions Release 5.21

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v (P) = 5683$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 7225 4700 Yes
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = (Equation 25-8)
 12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 5683 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 58.0$ pc/mi/ln
 R R 12 A
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M = 5.642
 S
 Space mean speed in ramp influence area, S = -64.8 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = mph

Phone: Fax:
 E-mail:

Merge Analysis

Analyst: Fehr & Peers
 Agency/Co.: Fehr & Peers
 Date performed: 5/24/2007
 Analysis time period: FM Peak Hour
 Freeway/Dir of Travel: SR 120 Westbound
 Junction: Airport Way
 Jurisdiction: Manteca/San Joaquin
 Analysis Year: C+P Conditions
 Description: Stadium Center III

Freeway Data

Type of analysis Merge
 Number of lanes in freeway 2
 Free-flow speed on freeway 65.0 mph
 Volume on freeway 2434 vph

On Ramp Data

Side of freeway Right
 Number of lanes in ramp 1
 Free-flow speed on ramp 35.0 mph
 Volume on ramp 1294 vph
 Length of first accel/decel lane 500 ft
 Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes
 Volume on adjacent Ramp 702 vph
 Position of adjacent Ramp Upstream
 Type of adjacent Ramp Off
 Distance to adjacent Ramp 2000 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2434	1294	702	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	676	359	195	v
Trucks and buses	10	10	10	%
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 0.952 0.952 0.952
 Driver population factor, fP 1.00 1.00 1.00
 Flow rate, vp 2840 1510 819 pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v = v (P) = 2840$ pc/h
 12 F FM

Capacity Checks

Actual Maximum LOS F?
 4350 4700 No
 v FO
 v 3 or v av34 0 pc/h (Equation 25-4 or 25-5)
 Is v 3 or v av34 > 2700 pc/h? No
 Is v 3 or v av34 > 1.5 v /2 No
 If yes, v = (Equation 25-8)
 12A

Flow Entering Merge Influence Area

Actual Max Desirable Violation?
 2840 4400 No
 v 12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 35.6$ pc/mi/ln
 R R 12 A
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, M = 0.588
 S
 Space mean speed in ramp influence area, S = 51.5 mph
 R
 Space mean speed in outer lanes, S = N/A mph
 0
 Space mean speed for all vehicles, S = 51.5 mph