Intersection Level of Service Calculations
Existing Conditions

HCM Unsignalized Intersection Capacity Analysis
1: Alder Ave/Alder Avenue & Gravenstein Highway

10/29/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	404	1	1	336	5	0	0	3	11	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			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)	13	439	1	1	365	5	0	0	3	12	0	12
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	371			440			848	839	440	839	836	368
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	371			440			848	839	440	839	836	368
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	99	96	100	98
cM capacity (veh/h)	1188			1120			274	299	617	281	299	677

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	453	372	3	24
Volume Left	13	1	0	12
Volume Right	1	5	3	12
cSH	1188	1120	617	397
Volume to Capacity	0.01	0.00	0.01	0.06
Queue Length 95th (ft)	1	0	0	5
Control Delay (s)	0.3	0.0	10.9	14.6
Lane LOS	A	A	B	B
Approach Delay (s)	0.3	0.0	10.9	14.6
Approach LOS			B	B

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		44.9%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: West Cotati Avenue & Gravenstein Highway

10/29/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	410	2	20	335	5	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	436	2	21	356	16	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1261		
pX, platoon unblocked					0.94	
vC, conflicting volume			436		836	437
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			436		796	437
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		95	95
cM capacity (veh/h)			1124		329	619

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	438	378	48
Volume Left	0	21	16
Volume Right	2	0	32
cSH	1700	1124	929
Volume to Capacity	0.26	0.02	0.05
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	0.7	12.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	12.9
Approach LOS			B

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization		44.0%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
3: Gravenstein Highway & Redwood Drive

10/29/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	325	25	34	300	198	25	21	29	128	26	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	16	16
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		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (prot)	1770	3370		1770	3406	1570	1770	1664		1681	1835	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (perm)	1770	3370		1770	3406	1570	1770	1664		1681	1835	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	62	346	27	36	319	211	27	22	31	136	28	43
RTOR Reduction (vph)	0	6	0	0	0	102	0	29	0	0	28	0
Lane Group Flow (vph)	62	367	0	36	319	109	27	24	0	106	73	0
Confl. Peds. (#/hr)			4			2			2			4
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2		1	6	7	8	8		7	7	
Permitted Phases						6						
Actuated Green, G (s)	4.0	15.4		2.2	13.6	24.9	3.4	3.4		11.3	11.3	
Effective Green, g (s)	4.0	15.4		2.2	13.6	24.9	3.4	3.4		11.3	11.3	
Actuated g/C Ratio	0.08	0.32		0.05	0.28	0.52	0.07	0.07		0.23	0.23	
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)	146	1074		80	959	939	124	117		393	429	
v/s Ratio Prot	c0.04	c0.11		0.02	0.09	0.03	c0.02	0.01		c0.06	0.04	
v/s Ratio Perm						0.04						
v/c Ratio	0.42	0.34		0.45	0.33	0.12	0.22	0.21		0.27	0.17	
Uniform Delay, d1	21.1	12.6		22.5	13.8	6.0	21.2	21.2		15.1	14.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.2		4.0	0.2	0.1	0.9	0.9		0.4	0.2	
Delay (s)	23.0	12.8		26.4	14.0	6.1	22.1	22.1		15.5	14.9	
Level of Service	C	B		C	B	A	C	C		B	B	
Approach Delay (s)		14.2			11.8			22.1			15.2	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Highway

10/29/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	259	212	187	346	0	0	0	0	270	1	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	15	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3406	1642	1770	3406					3433	1500	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3406	1642	1770	3406					3433	1500	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	273	223	197	364	0	0	0	0	284	1	197
RTOR Reduction (vph)	0	0	167	0	0	0	0	0	0	0	149	0
Lane Group Flow (vph)	0	273	56	197	364	0	0	0	0	284	49	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			5									5
Heavy Vehicles (%)	2%	6%	6%	2%	6%	6%	6%	6%	6%	2%	2%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		11.3	11.3	11.0	26.3					11.0	11.0	
Effective Green, g (s)		11.3	11.3	11.0	26.3					11.0	11.0	
Actuated g/C Ratio		0.25	0.25	0.24	0.58					0.24	0.24	
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)		849	409	429	1977					833	364	
v/s Ratio Prot		c0.08		c0.11	0.11					c0.08	0.03	
v/s Ratio Perm			0.03									
v/c Ratio		0.32	0.14	0.46	0.18					0.34	0.13	
Uniform Delay, d1		13.9	13.2	14.6	4.5					14.2	13.4	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.2	0.2	0.8	0.0					0.2	0.2	
Delay (s)		14.1	13.4	15.4	4.5					14.4	13.6	
Level of Service		B	B	B	A					B	B	
Approach Delay (s)		13.8			8.3			0.0			14.1	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: NB US 101 Off-ramp & Gravenstein Highway

10/29/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	528	0	0	383	157	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.91	0.97	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3406			5085	3303	1555
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3406			5085	3303	1555
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	556	0	0	403	165	49
RTOR Reduction (vph)	0	0	0	0	0	36
Lane Group Flow (vph)	556	0	0	403	165	13
Confl. Peds. (#/hr)						5
Confl. Bikes (#/hr)						5
Heavy Vehicles (%)	6%	2%	2%	2%	6%	2%
Turn Type	NA			NA	NA	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	11.6			11.6	7.0	7.0
Effective Green, g (s)	11.6			11.6	7.0	7.0
Actuated g/C Ratio	0.44			0.44	0.26	0.26
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)	1485			2217	869	409
v/s Ratio Prot	c0.16			0.08	c0.05	
v/s Ratio Perm						0.01
v/c Ratio	0.37			0.18	0.19	0.03
Uniform Delay, d1	5.1			4.6	7.6	7.3
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.2			0.0	0.1	0.0
Delay (s)	5.2			4.6	7.7	7.3
Level of Service	A			A	A	A
Approach Delay (s)	5.2			4.6	7.6	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	26.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Old Redwood Highway #1/NB US 101 On-ramp & Commerce Boulevard

10/29/2013

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	293	80	527	178	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	4.0	4.0	4.5	4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00		
Frt	1.00	0.85	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1888	1689	1827	1583		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1888	1689	1827	1583		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	299	82	538	182	0	0
RTOR Reduction (vph)	0	57	0	0	0	0
Lane Group Flow (vph)	299	25	538	182	0	0
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%
Turn Type	NA	Perm	NA	Free		
Protected Phases	7		6			
Permitted Phases		7		Free		
Actuated Green, G (s)	12.8	12.8	21.3	42.6		
Effective Green, g (s)	12.8	12.8	21.3	42.6		
Actuated g/C Ratio	0.30	0.30	0.50	1.00		
Clearance Time (s)	4.0	4.0	4.5			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	567	507	913	1583		
v/s Ratio Prot	c0.16		c0.29			
v/s Ratio Perm		0.01		0.11		
v/c Ratio	0.53	0.05	0.59	0.11		
Uniform Delay, d1	12.4	10.6	7.5	0.0		
Progression Factor	1.00	1.00	1.00	1.00		
Incremental Delay, d2	0.9	0.0	1.0	0.1		
Delay (s)	13.3	10.6	8.5	0.1		
Level of Service	B	B	A	A		
Approach Delay (s)	12.7		6.4			0.0
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	42.6	Sum of lost time (s)	8.5
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Old Redwood Highway #1 & Gravenstein Highway/Gravenstein Way

10/29/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	219	24	330	35	43	26	191	511	16	8	80	182
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
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.91	0.91		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.98		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	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	0.94		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	1863	1550	1770	1725		1610	3365		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	1863	1550	1770	1725		1610	3365		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	25	340	36	44	27	197	527	16	8	82	188
RTOR Reduction (vph)	0	0	258	0	22	0	0	2	0	0	0	0
Lane Group Flow (vph)	226	25	82	36	49	0	177	561	0	8	82	188
Confl. Peds. (#/hr)			5			6			9			2
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA		Split	NA		Split	NA	pt+ov
Protected Phases	8	8		7	7		6	6		5	5	5 8
Permitted Phases			8									
Actuated Green, G (s)	16.1	16.1	16.1	5.4	5.4		20.1	20.1		9.4	9.4	29.5
Effective Green, g (s)	16.1	16.1	16.1	5.4	5.4		20.1	20.1		9.4	9.4	29.5
Actuated g/C Ratio	0.24	0.24	0.24	0.08	0.08		0.30	0.30		0.14	0.14	0.44
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)	809	447	372	142	139		483	1009		248	261	696
v/s Ratio Prot	0.07	0.01		0.02	c0.03		0.11	c0.17		0.00	0.04	c0.12
v/s Ratio Perm			0.05									
v/c Ratio	0.28	0.06	0.22	0.25	0.35		0.37	0.56		0.03	0.31	0.27
Uniform Delay, d1	20.7	19.6	20.4	28.9	29.1		18.4	19.7		24.9	25.9	11.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	0.3	0.9	1.5		0.5	0.7		0.1	0.7	0.2
Delay (s)	20.9	19.7	20.7	29.9	30.7		18.9	20.4		24.9	26.6	12.1
Level of Service	C	B	C	C	C		B	C		C	C	B
Approach Delay (s)		20.7			30.4			20.0			16.8	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	67.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 AWSC
8: Old Redwood Highway #1 & William Street/George Street

10/29/2013

Intersection	
Intersection Delay, s/veh	18.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	52	1	7	7	2	20	10	700	2	5	509	28
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	57	1	8	8	2	22	11	769	2	5	559	31
Number of Lanes	0	1	0	0	1	0	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	1
HCM Control Delay	11.9	10.5	21.8	15
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	87%	24%	100%	0%	0%
Vol Thru, %	0%	100%	99%	2%	7%	0%	100%	86%
Vol Right, %	0%	0%	1%	12%	69%	0%	0%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	467	235	60	29	5	339	198
LT Vol	0	467	233	1	2	0	339	170
Through Vol	0	0	2	7	20	0	0	28
RT Vol	10	0	0	52	7	5	0	0
Lane Flow Rate	11	513	259	66	32	5	373	217
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.019	0.8	0.403	0.143	0.064	0.01	0.603	0.345
Departure Headway (Hd)	6.118	5.614	5.608	7.802	7.214	6.326	5.821	5.721
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	585	646	641	460	496	566	619	628
Service Time	3.85	3.346	3.34	5.554	4.97	4.063	3.559	3.459
HCM Lane V/C Ratio	0.019	0.794	0.404	0.143	0.065	0.009	0.603	0.346
HCM Control Delay	9	27	12.1	11.9	10.5	9.1	17.1	11.5
HCM Lane LOS	A	D	B	B	B	A	C	B
HCM 95th-tile Q	0.1	8	1.9	0.5	0.2	0	4	1.5

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
9: Old Redwood Highway #2/Old Redwood Highway #1 & West Sierra Avenue #4/East Cotati Avenue #3

10/29/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	157	6	13	290	385	7	263	4	247	222	27
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
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.98		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	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	0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1523	1770	3156		1770	3529		1770	1863	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1523	1770	3156		1770	3529		1770	1863	1531
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	66	165	6	14	305	405	7	277	4	260	234	28
RTOR Reduction (vph)	0	0	4	0	255	0	0	1	0	0	0	16
Lane Group Flow (vph)	66	165	2	14	455	0	7	280	0	260	234	12
Confl. Peds. (#/hr)			6			25			13			18
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	4.3	21.8	21.8	1.0	18.5		0.5	16.1		15.8	31.4	31.4
Effective Green, g (s)	4.3	21.8	21.8	1.0	18.5		0.5	16.1		15.8	31.4	31.4
Actuated g/C Ratio	0.06	0.31	0.31	0.01	0.26		0.01	0.23		0.22	0.44	0.44
Clearance 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)	107	574	469	25	825		12	803		395	827	679
v/s Ratio Prot	c0.04	c0.09		0.01	c0.14		0.00	c0.08		c0.15	0.13	
v/s Ratio Perm			0.00									0.01
v/c Ratio	0.62	0.29	0.00	0.56	0.55		0.58	0.35		0.66	0.28	0.02
Uniform Delay, d1	32.4	18.6	16.9	34.6	22.5		35.0	22.9		25.0	12.5	11.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.1	0.3	0.0	25.6	0.8		56.2	0.3		3.9	0.2	0.0
Delay (s)	42.5	18.8	16.9	60.3	23.3		91.2	23.2		28.9	12.7	11.0
Level of Service	D	B	B	E	C		F	C		C	B	B
Approach Delay (s)		25.4			24.0			24.8			20.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 AWSC
10: Old Redwood Highway #2 & Henry Street/Charles Street

10/29/2013

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	20	15	35	123	12	10	10	259	56	6	225	7
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	16	37	131	13	11	11	276	60	6	239	7
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	9.2	10.6	11.6	11.1
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	0%	29%	85%	3%
Vol Thru, %	96%	0%	21%	8%	95%
Vol Right, %	0%	100%	50%	7%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	269	56	70	145	238
LT Vol	259	0	15	12	225
Through Vol	0	56	35	10	7
RT Vol	10	0	20	123	6
Lane Flow Rate	286	60	74	154	253
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.431	0.078	0.114	0.245	0.364
Departure Headway (Hd)	5.535	4.809	5.519	5.718	5.174
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	655	749	651	629	696
Service Time	3.235	2.509	3.538	3.735	3.191
HCM Lane V/C Ratio	0.437	0.08	0.114	0.245	0.364
HCM Control Delay	12.4	7.9	9.2	10.6	11.1
HCM Lane LOS	B	A	A	B	B
HCM 95th-tile Q	2.2	0.3	0.4	1	1.7

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
11: Old Redwood Highway/Old Redwood Highway #2 & Valparaiso Avenue/Myrtle Avenue

10/29/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	33	44	163	74	57	25	258	50	30	351	2
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
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1676		1770	1712		1770	1863	1539	1770	1863	1533
Flt Permitted	0.67	1.00		0.71	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1249	1676		1314	1712		1770	1863	1539	1770	1863	1533
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	34	45	168	76	59	26	266	52	31	362	2
RTOR Reduction (vph)	0	32	0	0	27	0	0	0	31	0	0	1
Lane Group Flow (vph)	5	47	0	168	108	0	26	266	21	31	362	1
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	12.9	12.9		12.9	12.9		1.0	17.4	17.4	1.8	18.2	18.2
Effective Green, g (s)	12.9	12.9		12.9	12.9		1.0	17.4	17.4	1.8	18.2	18.2
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.02	0.39	0.39	0.04	0.41	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
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)	365	490		384	500		40	735	607	72	768	632
v/s Ratio Prot		0.03			0.06		0.01	0.14		c0.02	c0.19	
v/s Ratio Perm	0.00			c0.13					0.01			0.00
v/c Ratio	0.01	0.10		0.44	0.22		0.65	0.36	0.03	0.43	0.47	0.00
Uniform Delay, d1	11.1	11.4		12.7	11.8		21.4	9.4	8.2	20.6	9.4	7.6
Progression Factor	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	0.1		0.8	0.2		32.0	0.3	0.0	4.1	0.5	0.0
Delay (s)	11.1	11.4		13.5	12.0		53.3	9.7	8.2	24.7	9.9	7.6
Level of Service	B	B		B	B		D	A	A	C	A	A
Approach Delay (s)		11.4			12.8			12.8			11.1	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	44.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	47.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
12: SB US 101 On-ramp/West School Road & West Sierra Avenue #4

11/7/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	136	29	253	219	21	0	0	0	28	18	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	151	32	281	243	23	0	0	0	31	20	3
Pedestrians		1									1	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	268			151			1003	1002	167	990	974	257
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	268			151			1003	1002	167	990	974	257
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			80			100	100	100	84	90	100
cM capacity (veh/h)	1295			1430			172	194	877	191	202	780

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	186	548	54
Volume Left	2	281	31
Volume Right	32	23	3
cSH	1295	1430	204
Volume to Capacity	0.00	0.20	0.27
Queue Length 95th (ft)	0	18	26
Control Delay (s)	0.1	5.1	28.9
Lane LOS	A	A	D
Approach Delay (s)	0.1	5.1	28.9
Approach LOS			D

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: NB US 101 Off-ramp & West Sierra Avenue #4

10/29/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	164	0	0	470	23	81
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	200	0	0	573	28	99
Pedestrians	1			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			200		774	201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			200		774	201
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		92	88
cM capacity (veh/h)			1372		366	839

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	200	573	28	99
Volume Left	0	0	28	0
Volume Right	0	0	0	99
cSH	1700	1700	366	839
Volume to Capacity	0.12	0.34	0.08	0.12
Queue Length 95th (ft)	0	0	6	10
Control Delay (s)	0.0	0.0	15.6	9.9
Lane LOS			C	A
Approach Delay (s)	0.0	0.0	11.1	
Approach LOS			B	

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		35.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM 2010 AWSC
14: West Sierra Avenue #4 & East School Street

10/29/2013

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	4	243	318	11	12	13
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	286	374	13	14	15
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	9.8	10.9	8.4
HCM LOS	A	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	48%
Vol Thru, %	98%	97%	0%
Vol Right, %	0%	3%	52%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	247	329	25
LT Vol	243	318	0
Through Vol	0	11	13
RT Vol	4	0	12
Lane Flow Rate	291	387	29
Geometry Grp	1	1	1
Degree of Util (X)	0.355	0.461	0.042
Departure Headway (Hd)	4.396	4.284	5.162
Convergence, Y/N	Yes	Yes	Yes
Cap	819	844	693
Service Time	2.412	2.299	3.198
HCM Lane V/C Ratio	0.355	0.459	0.042
HCM Control Delay	9.8	10.9	8.4
HCM Lane LOS	A	B	A
HCM 95th-tile Q	1.6	2.5	0.1

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Unsignalized Intersection Capacity Analysis
15: Charles Street & East Cotati Avenue #3

10/29/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	448	3	139	729	1	76
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	477	3	148	776	1	81
Pedestrians	11			10	11	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	759					
pX, platoon unblocked						
vC, conflicting volume			491		1571	499
vC1, stage 1 conf vol					489	
vC2, stage 2 conf vol					1082	
vCu, unblocked vol			491		1571	499
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			86		100	86
cM capacity (veh/h)			1063		257	561

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	480	148	776	82
Volume Left	0	148	0	1
Volume Right	3	0	0	81
cSH	1700	1063	1700	553
Volume to Capacity	0.28	0.14	0.46	0.15
Queue Length 95th (ft)	0	12	0	13
Control Delay (s)	0.0	8.9	0.0	12.6
Lane LOS		A		B
Approach Delay (s)	0.0	1.4		12.6
Approach LOS				B

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		53.0%	ICU Level of Service A
Analysis Period (min)		15	

HCM 2010 AWSC
16: Lasalle Avenue & East Cotati Avenue #3

10/29/2013

Intersection	
Intersection Delay, s/veh	19.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	385	70	29	733	5	95	1	29	0	1	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	414	75	31	788	5	102	1	31	0	1	4
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	13	24	13.2	10
HCM LOS	B	C	B	A

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	76%	100%	0%	0%	100%	0%	0%	0%
Vol Thru, %	1%	0%	100%	65%	0%	100%	98%	20%
Vol Right, %	23%	0%	0%	35%	0%	0%	2%	80%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	125	10	257	198	29	489	249	5
LT Vol	1	0	257	128	0	489	244	1
Through Vol	29	0	0	70	0	0	5	4
RT Vol	95	10	0	0	29	0	0	0
Lane Flow Rate	134	11	276	213	31	525	268	5
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.281	0.02	0.467	0.346	0.054	0.834	0.424	0.011
Departure Headway (Hd)	7.52	6.594	6.088	5.837	6.22	5.715	5.7	7.171
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	477	542	591	614	576	636	630	497
Service Time	5.273	4.341	3.835	3.585	3.96	3.455	3.441	4.94
HCM Lane V/C Ratio	0.281	0.02	0.467	0.347	0.054	0.825	0.425	0.01
HCM Control Delay	13.2	9.5	14.1	11.7	9.3	30.7	12.6	10
HCM Lane LOS	B	A	B	B	A	D	B	A
HCM 95th-tile Q	1.1	0.1	2.5	1.5	0.2	8.9	2.1	0

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
17: East Cotati Avenue #3 & Adrian Drive

10/29/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	81	407	646	84	99	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3460		1770	1525
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3460		1770	1525
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	94	473	751	98	115	212
RTOR Reduction (vph)	0	0	10	0	0	172
Lane Group Flow (vph)	94	473	839	0	115	40
Confl. Peds. (#/hr)	17			11	11	17
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA		NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	7.3	38.2	26.9		10.7	10.7
Effective Green, g (s)	7.3	38.2	26.9		10.7	10.7
Actuated g/C Ratio	0.13	0.67	0.47		0.19	0.19
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	227	2375	1635		332	286
v/s Ratio Prot	c0.05	0.13	c0.24		c0.06	
v/s Ratio Perm						0.03
v/c Ratio	0.41	0.20	0.51		0.35	0.14
Uniform Delay, d1	22.8	3.5	10.4		20.1	19.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	0.0	0.3		0.6	0.2
Delay (s)	24.1	3.6	10.7		20.7	19.5
Level of Service	C	A	B		C	B
Approach Delay (s)		7.0	10.7		19.9	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
18: Lancaster Drive & East Cotati Avenue #3

10/29/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	475	50	84	607	3	83	1	179	8	1	12
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	0.95			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.95	1.00	0.96	
Flpb, ped/bikes	0.98	1.00		1.00	1.00			0.98	1.00	0.98	1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1743	3466		1770	3536			1746	1512	1737	1530	
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00	0.70	1.00	
Satd. Flow (perm)	1743	3466		1770	3536			1315	1512	1271	1530	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	8	540	57	95	690	3	94	1	203	9	1	14
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	162	0	11	0
Lane Group Flow (vph)	8	590	0	95	693	0	0	95	41	9	4	0
Confl. Peds. (#/hr)	28		23	24		29	23		24	29		28
Confl. Bikes (#/hr)			15			15			15			15
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	0.9	22.1		6.9	28.1			10.3	10.3	10.3	10.3	
Effective Green, g (s)	0.9	22.1		6.9	28.1			10.3	10.3	10.3	10.3	
Actuated g/C Ratio	0.02	0.43		0.13	0.55			0.20	0.20	0.20	0.20	
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)	30	1493		238	1936			264	303	255	307	
v/s Ratio Prot	0.00	0.17		c0.05	c0.20						0.00	
v/s Ratio Perm								c0.07	0.03	0.01		
v/c Ratio	0.27	0.39		0.40	0.36			0.36	0.13	0.04	0.01	
Uniform Delay, d1	24.9	10.0		20.3	6.5			17.7	16.8	16.5	16.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.7	0.2		1.1	0.1			0.8	0.2	0.1	0.0	
Delay (s)	29.6	10.2		21.4	6.6			18.5	17.0	16.6	16.4	
Level of Service	C	B		C	A			B	B	B	B	
Approach Delay (s)		10.4			8.4			17.5			16.5	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	51.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
19: Santero Way & East Cotati Avenue #3/East Cotati Avenue

10/29/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	585	12	17	596	22	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	713	15	21	727	27	17
Pedestrians	5			5	5	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1160					
pX, platoon unblocked						
vC, conflicting volume			733		1136	374
vC1, stage 1 conf vol					726	
vC2, stage 2 conf vol					410	
vCu, unblocked vol			733		1136	374
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		93	97
cM capacity (veh/h)			864		385	618

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	476	252	21	363	363	44
Volume Left	0	0	21	0	0	27
Volume Right	0	15	0	0	0	17
cSH	1700	1700	864	1700	1700	452
Volume to Capacity	0.28	0.15	0.02	0.21	0.21	0.10
Queue Length 95th (ft)	0	0	2	0	0	8
Control Delay (s)	0.0	0.0	9.3	0.0	0.0	13.8
Lane LOS			A			B
Approach Delay (s)	0.0		0.3			13.8
Approach LOS						B

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		28.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
20: Madrone Avenue & Gravenstein Highway/Gravenstein Hwy #5

10/29/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	364	27	101	322	0	15	0	133	4	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			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)	1	396	29	110	350	0	16	0	145	4	0	2
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	350			425			982	982	410	967	997	350
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	350			425			982	982	410	967	997	350
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			92	100	77	97	100	100
cM capacity (veh/h)	1209			1134			210	225	641	167	220	693

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1	425	110	350	161	7
Volume Left	1	0	110	0	16	4
Volume Right	0	29	0	0	145	2
cSH	1209	1700	1134	1700	531	224
Volume to Capacity	0.00	0.25	0.10	0.21	0.30	0.03
Queue Length 95th (ft)	0	0	8	0	32	2
Control Delay (s)	8.0	0.0	8.5	0.0	14.7	21.6
Lane LOS	A		A		B	C
Approach Delay (s)	0.0		2.0		14.7	21.6
Approach LOS					B	C

Intersection Summary			
Average Delay		3.3	
Intersection Capacity Utilization		45.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
1: Alder Ave/Alder Avenue & Gravenstein Highway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	573	0	0	787	9	0	0	0	5	0	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	603	0	0	828	9	0	0	0	5	0	14
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	838			603			1467	1458	603	1453	1453	833
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	838			603			1467	1458	603	1453	1453	833
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	95	100	96
cM capacity (veh/h)	796			974			101	128	499	107	129	368

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	612	838	0	19
Volume Left	8	0	0	5
Volume Right	0	9	0	14
cSH	796	974	1700	220
Volume to Capacity	0.01	0.00	0.00	0.09
Queue Length 95th (ft)	1	0	0	7
Control Delay (s)	0.3	0.0	0.0	22.9
Lane LOS	A		A	C
Approach Delay (s)	0.3	0.0	0.0	22.9
Approach LOS			A	C

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		52.0%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: West Cotati Avenue & Gravenstein Highway

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	567	8	47	788	3	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	597	8	49	829	9	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1261		
pX, platoon unblocked					0.79	
vC, conflicting volume			597		1529	601
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			597		1537	601
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		90	94
cM capacity (veh/h)			980		96	500

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	605	879	39
Volume Left	0	49	9
Volume Right	8	0	29
cSH	1700	980	393
Volume to Capacity	0.36	0.05	0.10
Queue Length 95th (ft)	0	4	8
Control Delay (s)	0.0	1.3	20.9
Lane LOS		A	C
Approach Delay (s)	0.0	1.3	20.9
Approach LOS			C

Intersection Summary				
Average Delay		1.3		
Intersection Capacity Utilization		87.7%	ICU Level of Service	E
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
3: Gravenstein Highway & Redwood Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	458	25	43	509	284	29	14	52	403	21	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	16	16
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		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.88		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (prot)	1770	3380		1770	3406	1569	1770	1588		1681	1719	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (perm)	1770	3380		1770	3406	1569	1770	1588		1681	1719	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	482	26	45	536	299	31	15	55	424	22	286
RTOR Reduction (vph)	0	4	0	0	0	101	0	52	0	0	181	0
Lane Group Flow (vph)	137	504	0	45	536	198	31	18	0	382	169	0
Confl. Peds. (#/hr)			4			2			2			4
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2		1	6	7	8	8		7	7	
Permitted Phases						6						
Actuated Green, G (s)	12.4	32.0		17.3	36.9	66.1	5.5	5.5		29.2	29.2	
Effective Green, g (s)	12.4	32.0		17.3	36.9	66.1	5.5	5.5		29.2	29.2	
Actuated g/C Ratio	0.12	0.32		0.17	0.37	0.66	0.06	0.06		0.29	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)	219	1081		306	1256	1099	97	87		490	501	
v/s Ratio Prot	c0.08	c0.15		0.03	c0.16	0.05	c0.02	0.01		c0.23	0.10	
v/s Ratio Perm						0.07						
v/c Ratio	0.63	0.47		0.15	0.43	0.18	0.32	0.21		0.78	0.34	
Uniform Delay, d1	41.6	27.2		35.1	23.6	6.5	45.5	45.2		32.5	27.8	
Progression Factor	1.00	1.00		1.22	0.64	0.38	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.5	0.3		1.0	1.0	0.1	1.9	1.2		7.7	0.4	
Delay (s)	47.1	27.5		43.7	16.2	2.5	47.4	46.4		40.1	28.2	
Level of Service	D	C		D	B	A	D	D		D	C	
Approach Delay (s)		31.7			13.0			46.7			34.4	
Approach LOS		C			B			D			C	

Intersection Summary				
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	63.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Highway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	642	264	97	724	0	0	0	0	479	1	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	15	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3406	1638	1770	3406					3433	1500	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3406	1638	1770	3406					3433	1500	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	676	278	102	762	0	0	0	0	504	1	157
RTOR Reduction (vph)	0	0	123	0	0	0	0	0	0	0	122	0
Lane Group Flow (vph)	0	676	155	102	762	0	0	0	0	504	36	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			5									5
Heavy Vehicles (%)	2%	6%	6%	2%	6%	6%	6%	6%	6%	2%	2%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		55.9	55.9	9.7	69.6					22.4	22.4	
Effective Green, g (s)		55.9	55.9	9.7	69.6					22.4	22.4	
Actuated g/C Ratio		0.56	0.56	0.10	0.70					0.22	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)		1903	915	171	2370					768	336	
v/s Ratio Prot		c0.20		c0.06	0.22					c0.15	0.02	
v/s Ratio Perm			0.09									
v/c Ratio		0.36	0.17	0.60	0.32					0.66	0.11	
Uniform Delay, d1		12.1	10.7	43.3	6.0					35.3	30.9	
Progression Factor		0.53	0.63	0.91	0.70					1.00	1.00	
Incremental Delay, d2		0.4	0.3	5.5	0.4					2.0	0.1	
Delay (s)		6.9	7.2	44.9	4.5					37.3	31.0	
Level of Service		A	A	D	A					D	C	
Approach Delay (s)		7.0			9.3			0.0			35.8	
Approach LOS		A			A			A			D	

Intersection Summary				
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: NB US 101 Off-ramp & Gravenstein Highway

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1121	0	0	544	273	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.91	0.97	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3406			5085	3303	1544
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3406			5085	3303	1544
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1180	0	0	573	287	193
RTOR Reduction (vph)	0	0	0	0	0	73
Lane Group Flow (vph)	1180	0	0	573	287	120
Confl. Peds. (#/hr)						5
Confl. Bikes (#/hr)						5
Heavy Vehicles (%)	6%	2%	2%	2%	6%	2%
Turn Type	NA			NA	NA	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	76.2			76.2	15.8	15.8
Effective Green, g (s)	76.2			76.2	15.8	15.8
Actuated g/C Ratio	0.76			0.76	0.16	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)	2595			3874	521	243
v/s Ratio Prot	c0.35			0.11	c0.09	
v/s Ratio Perm						0.08
v/c Ratio	0.45			0.15	0.55	0.49
Uniform Delay, d1	4.3			3.2	38.8	38.4
Progression Factor	0.15			0.37	1.00	1.00
Incremental Delay, d2	0.5			0.1	1.3	1.6
Delay (s)	1.2			1.2	40.1	40.0
Level of Service	A			A	D	D
Approach Delay (s)	1.2			1.2	40.1	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Old Redwood Highway #1/NB US 101 On-ramp & Commerce Boulevard

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	436	49	365	684	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	4.0	4.0	4.5	4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00		
Frt	1.00	0.85	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1888	1689	1827	1583		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1888	1689	1827	1583		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	464	52	388	728	0	0
RTOR Reduction (vph)	0	31	0	0	0	0
Lane Group Flow (vph)	464	21	388	728	0	0
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%
Turn Type	NA	Perm	NA	Free		
Protected Phases	7		6			
Permitted Phases		7		Free		
Actuated Green, G (s)	16.8	16.8	15.8	41.1		
Effective Green, g (s)	16.8	16.8	15.8	41.1		
Actuated g/C Ratio	0.41	0.41	0.38	1.00		
Clearance Time (s)	4.0	4.0	4.5			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	771	690	702	1583		
v/s Ratio Prot	c0.25		0.21			
v/s Ratio Perm		0.01		c0.46		
v/c Ratio	0.60	0.03	0.55	0.46		
Uniform Delay, d1	9.5	7.3	9.9	0.0		
Progression Factor	1.00	1.00	1.00	1.00		
Incremental Delay, d2	1.3	0.0	0.9	1.0		
Delay (s)	10.9	7.3	10.8	1.0		
Level of Service	B	A	B	A		
Approach Delay (s)	10.5		4.4			0.0
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	41.1	Sum of lost time (s)	8.5
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Old Redwood Highway #1 & Gravenstein Highway/Gravenstein Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	507	91	738	48	51	48	295	579	50	20	198	194
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
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.91	0.91		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.97		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	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	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	1863	1549	1770	1680		1610	3330		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	1863	1549	1770	1680		1610	3330		1770	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	534	96	777	51	54	51	311	609	53	21	208	204
RTOR Reduction (vph)	0	0	441	0	34	0	0	6	0	0	0	0
Lane Group Flow (vph)	534	96	336	51	71	0	280	687	0	21	208	204
Confl. Peds. (#/hr)			5			6			9			2
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA		Split	NA		Split	NA	pt+ov
Protected Phases	8	8		7	7		6	6		5	5	5 8
Permitted Phases			8									
Actuated Green, G (s)	34.2	34.2	34.2	6.4	6.4		26.4	26.4		17.0	17.0	55.2
Effective Green, g (s)	34.2	34.2	34.2	6.4	6.4		26.4	26.4		17.0	17.0	55.2
Actuated g/C Ratio	0.34	0.34	0.34	0.06	0.06		0.26	0.26		0.17	0.17	0.55
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)	1151	637	529	113	107		425	879		300	316	873
v/s Ratio Prot	0.16	0.05		0.03	c0.04		0.17	c0.21		0.01	c0.11	0.13
v/s Ratio Perm			c0.22									
v/c Ratio	0.46	0.15	0.64	0.45	0.67		0.66	0.78		0.07	0.66	0.23
Uniform Delay, d1	25.7	22.8	27.7	45.1	45.8		32.8	34.1		34.9	38.8	11.5
Progression Factor	0.75	0.77	1.29	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	0.5	5.3	2.8	14.6		3.7	4.6		0.1	4.9	0.1
Delay (s)	20.4	18.0	40.9	48.0	60.3		36.5	38.7		35.0	43.7	11.7
Level of Service	C	B	D	D	E		D	D		C	D	B
Approach Delay (s)		31.6			56.3			38.1			28.2	
Approach LOS		C			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 AWSC
8: Old Redwood Highway #1 & William Street/George Street

Intersection	
Intersection Delay, s/veh	44.4
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	60	2	22	4	1	27	11	892	7	25	949	43
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	63	2	23	4	1	28	12	939	7	26	999	45
Number of Lanes	0	1	0	0	1	0	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	1
HCM Control Delay	13.5	11.4	46.8	45.9
HCM LOS	B	B	E	E

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	71%	12%	100%	0%	0%
Vol Thru, %	0%	100%	98%	2%	3%	0%	100%	88%
Vol Right, %	0%	0%	2%	26%	84%	0%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	11	595	304	84	32	25	633	359
LT Vol	0	595	297	2	1	0	633	316
Through Vol	0	0	7	22	27	0	0	43
RT Vol	11	0	0	60	4	25	0	0
Lane Flow Rate	12	626	320	88	34	26	666	378
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.022	1	0.564	0.209	0.075	0.049	1	0.65
Departure Headway (Hd)	6.857	6.358	6.342	8.503	8.022	6.77	6.271	6.187
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	523	576	570	424	448	531	579	586
Service Time	4.58	4.081	4.065	6.224	5.744	4.487	3.988	3.905
HCM Lane V/C Ratio	0.023	1.087	0.561	0.208	0.076	0.049	1.15	0.645
HCM Control Delay	9.7	62.7	17	13.5	11.4	9.8	62.2	19.7
HCM Lane LOS	A	F	C	B	B	A	F	C
HCM 95th-tile Q	0.1	14.5	3.5	0.8	0.2	0.2	14.7	4.7

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
9: Old Redwood Highway #2/Old Redwood Highway #1 & West Sierra Avenue #4/East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	248	5	24	191	393	3	431	4	407	374	64
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
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.97		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	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	0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1517	1770	3074		1770	3533		1770	1863	1526
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1517	1770	3074		1770	3533		1770	1863	1526
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	112	264	5	26	203	418	3	459	4	433	398	68
RTOR Reduction (vph)	0	0	4	0	338	0	0	1	0	0	0	33
Lane Group Flow (vph)	112	264	1	26	283	0	3	462	0	433	398	35
Confl. Peds. (#/hr)			6			25			13			18
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	7.9	21.4	21.4	2.7	16.2		0.6	19.9		24.5	43.8	43.8
Effective Green, g (s)	7.9	21.4	21.4	2.7	16.2		0.6	19.9		24.5	43.8	43.8
Actuated g/C Ratio	0.09	0.25	0.25	0.03	0.19		0.01	0.24		0.29	0.52	0.52
Clearance 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)	165	471	384	56	589		12	832		513	965	790
v/s Ratio Prot	c0.06	c0.14		0.01	0.09		0.00	c0.13		c0.24	0.21	
v/s Ratio Perm			0.00									0.02
v/c Ratio	0.68	0.56	0.00	0.46	0.48		0.25	0.56		0.84	0.41	0.04
Uniform Delay, d1	37.1	27.5	23.6	40.2	30.4		41.7	28.4		28.2	12.5	10.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.6	1.5	0.0	6.0	0.6		10.7	0.8		12.1	0.3	0.0
Delay (s)	47.6	29.0	23.6	46.2	31.0		52.4	29.2		40.3	12.8	10.1
Level of Service	D	C	C	D	C		D	C		D	B	B
Approach Delay (s)		34.4			31.6			29.4			25.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	84.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 AWSC
10: Old Redwood Highway #2 & Henry Street/Charles Street

Intersection	
Intersection Delay, s/veh	18.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	13	21	13	84	14	18	15	411	162	28	346	12
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	24	15	95	16	20	17	467	184	32	393	14
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	10.6	11.9	20.6	18.9
HCM LOS	B	B	C	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	0%	28%	72%	7%
Vol Thru, %	96%	0%	45%	12%	90%
Vol Right, %	0%	100%	28%	16%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	426	162	47	116	386
LT Vol	411	0	21	14	346
Through Vol	0	162	13	18	12
RT Vol	15	0	13	84	28
Lane Flow Rate	484	184	53	132	439
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.767	0.255	0.101	0.244	0.667
Departure Headway (Hd)	5.706	4.98	6.777	6.665	5.478
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	634	720	526	537	658
Service Time	3.447	2.72	4.852	4.728	3.521
HCM Lane V/C Ratio	0.763	0.256	0.101	0.246	0.667
HCM Control Delay	24.8	9.4	10.6	11.9	18.9
HCM Lane LOS	C	A	B	B	C
HCM 95th-tile Q	7.1	1	0.3	1	5.1

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
11: Old Redwood Highway/Old Redwood Highway #2 & Valparaiso Avenue/Myrtle Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	51	23	59	25	48	33	500	156	92	316	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	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
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1756		1770	1628		1770	1863	1540	1770	1863	1531
Flt Permitted	0.71	1.00		0.70	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1314	1756		1313	1628		1770	1863	1540	1770	1863	1531
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	8	55	25	63	27	52	35	538	168	99	340	18
RTOR Reduction (vph)	0	19	0	0	44	0	0	0	74	0	0	7
Lane Group Flow (vph)	8	61	0	63	35	0	35	538	94	99	340	11
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	8.4	8.4		8.4	8.4		2.5	29.7	29.7	7.1	34.3	34.3
Effective Green, g (s)	8.4	8.4		8.4	8.4		2.5	29.7	29.7	7.1	34.3	34.3
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.04	0.52	0.52	0.12	0.60	0.60
Clearance 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)	192	257		192	239		77	967	799	219	1117	918
v/s Ratio Prot		0.03			0.02		0.02	c0.29		c0.06	0.18	
v/s Ratio Perm	0.01			c0.05					0.06			0.01
v/c Ratio	0.04	0.24		0.33	0.14		0.45	0.56	0.12	0.45	0.30	0.01
Uniform Delay, d1	20.9	21.6		21.9	21.3		26.7	9.3	7.0	23.2	5.6	4.6
Progression Factor	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	0.5		1.0	0.3		4.2	0.7	0.1	1.5	0.2	0.0
Delay (s)	21.0	22.1		22.9	21.6		30.9	10.0	7.1	24.7	5.8	4.6
Level of Service	C	C		C	C		C	A	A	C	A	A
Approach Delay (s)		22.0			22.1			10.3			9.8	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	57.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
12: SB US 101 On-ramp/West School Road & West Sierra Avenue #4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	134	15	105	138	43	0	0	0	17	5	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	149	17	117	153	48	0	0	0	19	6	2
Pedestrians		1									1	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	202			149			580	599	157	575	567	179
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	202			149			580	599	157	575	567	179
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			100	100	100	95	99	100
cM capacity (veh/h)	1369			1433			392	380	888	401	396	862

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	169	318	27
Volume Left	3	117	19
Volume Right	17	48	2
cSH	1369	1433	418
Volume to Capacity	0.00	0.08	0.06
Queue Length 95th (ft)	0	7	5
Control Delay (s)	0.2	3.3	14.2
Lane LOS	A	A	B
Approach Delay (s)	0.2	3.3	14.2
Approach LOS			B

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: NB US 101 Off-ramp & West Sierra Avenue #4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	162	0	0	241	35	220
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	171	0	0	254	37	232
Pedestrians	1			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			171		425	172
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			171		425	172
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	73
cM capacity (veh/h)			1407		585	871

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	171	254	37	232
Volume Left	0	0	37	0
Volume Right	0	0	0	232
cSH	1700	1700	585	871
Volume to Capacity	0.10	0.15	0.06	0.27
Queue Length 95th (ft)	0	0	5	27
Control Delay (s)	0.0	0.0	11.6	10.6
Lane LOS			B	B
Approach Delay (s)	0.0	0.0	10.7	
Approach LOS			B	

Intersection Summary			
Average Delay		4.2	
Intersection Capacity Utilization		28.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM 2010 AWSC
14: West Sierra Avenue #4 & East School Street

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	15	335	268	27	24	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	353	282	28	25	9
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	10.8	10	8.7
HCM LOS	B	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	0%	73%
Vol Thru, %	96%	91%	0%
Vol Right, %	0%	9%	27%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	350	295	33
LT Vol	335	268	0
Through Vol	0	27	9
RT Vol	15	0	24
Lane Flow Rate	368	311	35
Geometry Grp	1	1	1
Degree of Util (X)	0.445	0.375	0.052
Departure Headway (Hd)	4.35	4.346	5.367
Convergence, Y/N	Yes	Yes	Yes
Cap	829	829	667
Service Time	2.366	2.362	3.403
HCM Lane V/C Ratio	0.444	0.375	0.052
HCM Control Delay	10.8	10	8.7
HCM Lane LOS	B	A	A
HCM 95th-tile Q	2.3	1.8	0.2

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Unsignalized Intersection Capacity Analysis
15: Charles Street & East Cotati Avenue #3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	778	8	106	623	5	211
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	828	9	113	663	5	224
Pedestrians	11			10	11	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	759					
pX, platoon unblocked			0.90		0.90	0.90
vC, conflicting volume			847		1742	853
vC1, stage 1 conf vol					843	
vC2, stage 2 conf vol					899	
vCu, unblocked vol			777		1768	784
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			85		98	36
cM capacity (veh/h)			751		260	349

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	836	113	663	230
Volume Left	0	113	0	5
Volume Right	9	0	0	224
cSH	1700	751	1700	346
Volume to Capacity	0.49	0.15	0.39	0.66
Queue Length 95th (ft)	0	13	0	113
Control Delay (s)	0.0	10.6	0.0	33.7
Lane LOS		B		D
Approach Delay (s)	0.0	1.5		33.7
Approach LOS				D

Intersection Summary			
Average Delay		4.9	
Intersection Capacity Utilization		71.7%	ICU Level of Service C
Analysis Period (min)		15	

HCM 2010 AWSC
16: Lasalle Avenue & East Cotati Avenue #3

Intersection	
Intersection Delay, s/veh	36.7
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	830	146	57	564	3	143	0	60	5	1	9
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	892	157	61	606	3	154	0	65	5	1	10
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	49.4	23.3	18.7	11.6
HCM LOS	E	C	C	B

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	70%	100%	0%	0%	100%	0%	0%	33%
Vol Thru, %	0%	0%	100%	65%	0%	100%	98%	7%
Vol Right, %	30%	0%	0%	35%	0%	0%	2%	60%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	203	3	553	423	57	376	191	15
LT Vol	0	0	553	277	0	376	188	1
Through Vol	60	0	0	146	0	0	3	9
RT Vol	143	3	0	0	57	0	0	5
Lane Flow Rate	218	3	595	454	61	404	205	16
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.495	0.006	1	0.804	0.126	0.776	0.393	0.038
Departure Headway (Hd)	8.159	7.125	6.614	6.367	7.409	6.908	6.897	8.474
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	441	500	547	568	483	522	520	421
Service Time	5.917	4.897	4.386	4.139	5.169	4.668	4.657	6.253
HCM Lane V/C Ratio	0.494	0.006	1.088	0.799	0.126	0.774	0.394	0.038
HCM Control Delay	18.7	9.9	64.2	30.4	11.2	29.8	14.1	11.6
HCM Lane LOS	C	A	F	D	B	D	B	B
HCM 95th-tile Q	2.7	0	14.2	7.8	0.4	7	1.9	0.1

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
17: East Cotati Avenue #3 & Adrian Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	172	795	556	91	129	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3442		1770	1526
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3442		1770	1526
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	185	855	598	98	139	166
RTOR Reduction (vph)	0	0	14	0	0	115
Lane Group Flow (vph)	185	855	682	0	139	51
Confl. Peds. (#/hr)	17			11	11	17
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA		NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	12.1	37.2	21.1		11.2	11.2
Effective Green, g (s)	12.1	37.2	21.1		11.2	11.2
Actuated g/C Ratio	0.21	0.66	0.37		0.20	0.20
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	379	2334	1287		351	303
v/s Ratio Prot	c0.10	0.24	c0.20		c0.08	
v/s Ratio Perm						0.03
v/c Ratio	0.49	0.37	0.53		0.40	0.17
Uniform Delay, d1	19.4	4.3	13.8		19.7	18.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.1	0.4		0.7	0.3
Delay (s)	20.4	4.4	14.2		20.4	19.0
Level of Service	C	A	B		C	B
Approach Delay (s)		7.3	14.2		19.6	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
18: Lancaster Drive & East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	777	141	114	558	7	86	0	123	1	0	4
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	0.95			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.94	1.00	0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98	1.00	0.97	1.00	
Frt	1.00	0.98		1.00	1.00			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	3418		1770	3529			1730	1496	1725	1490	
Flt Permitted	0.95	1.00		0.95	1.00			0.76	1.00	0.70	1.00	
Satd. Flow (perm)	1770	3418		1770	3529			1375	1496	1267	1490	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	14	827	150	121	594	7	91	0	131	1	0	4
RTOR Reduction (vph)	0	13	0	0	1	0	0	0	110	0	3	0
Lane Group Flow (vph)	14	964	0	121	600	0	0	91	21	1	1	0
Confl. Peds. (#/hr)	28		23	24		29	23		24	29		28
Confl. Bikes (#/hr)			15			15			15			15
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.1	37.7		8.6	45.2			11.0	11.0	11.0	11.0	
Effective Green, g (s)	1.1	37.7		8.6	45.2			11.0	11.0	11.0	11.0	
Actuated g/C Ratio	0.02	0.54		0.12	0.65			0.16	0.16	0.16	0.16	
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)	28	1859		219	2301			218	237	201	236	
v/s Ratio Prot	0.01	c0.28		c0.07	0.17						0.00	
v/s Ratio Perm								c0.07	0.01	0.00		
v/c Ratio	0.50	0.52		0.55	0.26			0.42	0.09	0.00	0.00	
Uniform Delay, d1	33.8	10.0		28.5	5.0			26.3	24.9	24.5	24.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.4	0.2		3.0	0.1			1.3	0.2	0.0	0.0	
Delay (s)	47.2	10.3		31.5	5.1			27.6	25.0	24.6	24.5	
Level of Service	D	B		C	A			C	C	C	C	
Approach Delay (s)		10.8			9.5			26.1			24.5	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	69.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
19: Santero Way & East Cotati Avenue #3/East Cotati Avenue

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	812	21	33	722	19	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	883	23	36	785	21	18
Pedestrians	5			5	5	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1160					
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			910		1368	463
vC1, stage 1 conf vol					899	
vC2, stage 2 conf vol					469	
vCu, unblocked vol			835		1310	372
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			95		94	97
cM capacity (veh/h)			763		329	599

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	588	317	36	392	392	39
Volume Left	0	0	36	0	0	21
Volume Right	0	23	0	0	0	18
cSH	1700	1700	763	1700	1700	418
Volume to Capacity	0.35	0.19	0.05	0.23	0.23	0.09
Queue Length 95th (ft)	0	0	4	0	0	8
Control Delay (s)	0.0	0.0	9.9	0.0	0.0	14.5
Lane LOS			A			B
Approach Delay (s)	0.0		0.4			14.5
Approach LOS						B

Intersection Summary				
Average Delay		0.5		
Intersection Capacity Utilization		39.0%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
20: Madrone Avenue & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	560	6	38	597	1	6	1	45	12	0	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	6	589	6	40	628	1	6	1	47	13	0	8
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	629			596			1314	1315	593	1312	1317	629
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	629			596			1314	1315	593	1312	1317	629
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			95	99	91	89	100	98
cM capacity (veh/h)	953			981			128	151	506	118	150	482

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	6	596	40	629	55	21
Volume Left	6	0	40	0	6	13
Volume Right	0	6	0	1	47	8
cSH	953	1700	981	1700	365	169
Volume to Capacity	0.01	0.35	0.04	0.37	0.15	0.12
Queue Length 95th (ft)	1	0	3	0	13	10
Control Delay (s)	8.8	0.0	8.8	0.0	16.6	29.3
Lane LOS	A		A		C	D
Approach Delay (s)	0.1		0.5		16.6	29.3
Approach LOS					C	D

Intersection Summary				
Average Delay		1.4		
Intersection Capacity Utilization		42.3%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection Level of Service Calculations
Future No Project Conditions

HCM Unsignalized Intersection Capacity Analysis
1: Alder Ave/Alder Avenue & Gravenstein Hwy #5

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	650	1	1	540	6	0	0	3	14	0	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			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)	15	707	1	1	587	7	0	0	3	15	0	14
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	593			708			1344	1333	707	1333	1330	590
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	593			708			1344	1333	707	1333	1330	590
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	99	88	100	97
cM capacity (veh/h)	983			891			124	151	435	128	152	507

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	723	595	3	29
Volume Left	15	1	0	15
Volume Right	1	7	3	14
cSH	983	891	435	201
Volume to Capacity	0.02	0.00	0.01	0.15
Queue Length 95th (ft)	1	0	1	13
Control Delay (s)	0.4	0.0	13.3	26.0
Lane LOS	A	A	B	D
Approach Delay (s)	0.4	0.0	13.3	26.0
Approach LOS			B	D

Intersection Summary				
Average Delay		0.8		
Intersection Capacity Utilization		59.8%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: West Cotati Avenue & Gravenstein Hwy #5

8/21/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	676	2	23	527	6	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	719	2	24	561	19	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1261		
pX, platoon unblocked					0.81	
vC, conflicting volume			719		1330	720
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			719		1290	720
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		87	92
cM capacity (veh/h)			882		142	428

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	721	585	55
Volume Left	0	24	19
Volume Right	2	0	36
cSH	1700	882	411
Volume to Capacity	0.42	0.03	0.13
Queue Length 95th (ft)	0	2	12
Control Delay (s)	0.0	0.7	21.1
Lane LOS		A	C
Approach Delay (s)	0.0	0.7	21.1
Approach LOS			C

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization		56.4%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
3: Gravenstein Hwy #5 & Redwood Drive

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	66	638	28	38	442	233	28	24	38	404	35	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	16	16
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		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	
Satd. Flow (prot)	1770	3385		1770	3406	1570	1770	1657		1681	1839	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	
Satd. Flow (perm)	1770	3385		1770	3406	1570	1770	1657		1681	1839	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	70	679	30	40	470	248	30	26	40	430	37	98
RTOR Reduction (vph)	0	3	0	0	0	98	0	37	0	0	21	0
Lane Group Flow (vph)	70	706	0	40	470	150	30	29	0	288	256	0
Confl. Peds. (#/hr)			4			2			2			4
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2		1	6	7	8	8		7	7	
Permitted Phases						6						
Actuated Green, G (s)	6.4	25.2		4.1	22.9	42.4	5.1	5.1		19.5	19.5	
Effective Green, g (s)	6.4	25.2		4.1	22.9	42.4	5.1	5.1		19.5	19.5	
Actuated g/C Ratio	0.09	0.36		0.06	0.33	0.61	0.07	0.07		0.28	0.28	
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)	162	1220		103	1115	1042	129	120		468	513	
v/s Ratio Prot	c0.04	c0.21		0.02	0.14	0.04	0.02	c0.02		c0.17	0.14	
v/s Ratio Perm						0.06						
v/c Ratio	0.43	0.58		0.39	0.42	0.14	0.23	0.24		0.62	0.50	
Uniform Delay, d1	30.0	18.1		31.7	18.3	5.9	30.6	30.6		21.9	21.1	
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	0.7		2.4	0.3	0.1	0.9	1.0		2.4	0.8	
Delay (s)	31.9	18.7		34.1	18.6	6.0	31.5	31.6		24.3	21.9	
Level of Service	C	B		C	B	A	C	C		C	C	
Approach Delay (s)		19.9			15.3			31.6			23.1	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	69.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	550	542	211	407	0	0	0	0	402	1	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	15	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3406	1640	1770	3406					3433	1499	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3406	1640	1770	3406					3433	1499	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	579	571	222	428	0	0	0	0	423	1	322
RTOR Reduction (vph)	0	0	351	0	0	0	0	0	0	0	243	0
Lane Group Flow (vph)	0	579	220	222	428	0	0	0	0	423	80	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			5									5
Heavy Vehicles (%)	2%	6%	6%	2%	6%	6%	6%	6%	6%	2%	2%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		28.1	28.1	15.0	47.1					17.8	17.8	
Effective Green, g (s)		28.1	28.1	15.0	47.1					17.8	17.8	
Actuated g/C Ratio		0.39	0.39	0.21	0.65					0.24	0.24	
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)		1312	632	364	2200					838	366	
v/s Ratio Prot		c0.17		c0.13	0.13					c0.12	0.05	
v/s Ratio Perm			0.13									
v/c Ratio		0.44	0.35	0.61	0.19					0.50	0.22	
Uniform Delay, d1		16.6	15.9	26.3	5.2					23.8	22.0	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.2	0.3	2.9	0.0					0.5	0.3	
Delay (s)		16.8	16.2	29.2	5.3					24.2	22.3	
Level of Service		B	B	C	A					C	C	
Approach Delay (s)		16.5			13.4			0.0			23.4	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	72.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: NB US 101 Off-ramp & Gravenstein Hwy #5

8/21/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	952	0	0	383	235	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.91	0.97	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3406			5085	3303	1553
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3406			5085	3303	1553
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1002	0	0	403	247	167
RTOR Reduction (vph)	0	0	0	0	0	91
Lane Group Flow (vph)	1002	0	0	403	247	76
Confl. Peds. (#/hr)						5
Confl. Bikes (#/hr)						5
Heavy Vehicles (%)	6%	2%	2%	2%	6%	2%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	23.5			23.5	10.2	10.2
Effective Green, g (s)	23.5			23.5	10.2	10.2
Actuated g/C Ratio	0.56			0.56	0.24	0.24
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)	1919			2865	807	379
v/s Ratio Prot	c0.29			0.08	c0.07	
v/s Ratio Perm						0.05
v/c Ratio	0.52			0.14	0.31	0.20
Uniform Delay, d1	5.6			4.3	12.9	12.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.3			0.0	0.2	0.3
Delay (s)	5.9			4.3	13.1	12.8
Level of Service	A			A	B	B
Approach Delay (s)	5.9			4.3	13.0	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	41.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Old Redwood Highway #1/NB US 101 On-ramp & Commerce Boulevard

8/21/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	293	156	444	449	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	4.0	4.0	4.5	4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00		
Frt	1.00	0.85	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1888	1689	1827	1583		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1888	1689	1827	1583		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	299	159	453	458	0	0
RTOR Reduction (vph)	0	120	0	0	0	0
Lane Group Flow (vph)	299	39	453	458	0	0
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%
Turn Type	Prot	Perm	NA	Free		
Protected Phases	7		6			
Permitted Phases		7		Free		
Actuated Green, G (s)	14.7	14.7	36.7	59.9		
Effective Green, g (s)	14.7	14.7	36.7	59.9		
Actuated g/C Ratio	0.25	0.25	0.61	1.00		
Clearance Time (s)	4.0	4.0	4.5			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	463	414	1119	1583		
v/s Ratio Prot	c0.16		c0.25			
v/s Ratio Perm		0.02		0.29		
v/c Ratio	0.65	0.09	0.40	0.29		
Uniform Delay, d1	20.3	17.5	6.0	0.0		
Progression Factor	1.00	1.00	1.00	1.00		
Incremental Delay, d2	3.1	0.1	1.1	0.5		
Delay (s)	23.4	17.6	7.1	0.5		
Level of Service	C	B	A	A		
Approach Delay (s)	21.3		3.7			0.0
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	8.5
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Old Redwood Highway #1 & Gravenstein Hwy #5/Gravenstein Way

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	472	36	590	28	49	25	173	414	8	3	80	182
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
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.91	0.91		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.98		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	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	0.95		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	1863	1552	1770	1736		1610	3372		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	1863	1552	1770	1736		1610	3372		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	487	37	608	29	51	26	178	427	8	3	82	188
RTOR Reduction (vph)	0	0	381	0	19	0	0	1	0	0	0	0
Lane Group Flow (vph)	487	37	227	29	58	0	160	452	0	3	82	188
Confl. Peds. (#/hr)			5			6			9			2
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA		Split	NA		Split	NA	pt+ov
Protected Phases	8	8		7	7		6	6		5	5	5 8
Permitted Phases			8									
Actuated Green, G (s)	27.8	27.8	27.8	5.0	5.0		16.1	16.1		9.6	9.6	41.4
Effective Green, g (s)	27.8	27.8	27.8	5.0	5.0		16.1	16.1		9.6	9.6	41.4
Actuated g/C Ratio	0.37	0.37	0.37	0.07	0.07		0.22	0.22		0.13	0.13	0.56
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)	1256	695	579	118	116		347	728		228	240	879
v/s Ratio Prot	0.14	0.02		0.02	c0.03		0.10	c0.13		0.00	c0.04	0.12
v/s Ratio Perm			c0.15									
v/c Ratio	0.39	0.05	0.39	0.25	0.50		0.46	0.62		0.01	0.34	0.21
Uniform Delay, d1	17.1	14.9	17.1	33.0	33.6		25.4	26.4		28.3	29.6	8.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.4	1.1	3.4		1.0	1.7		0.0	0.9	0.1
Delay (s)	17.3	15.0	17.6	34.1	37.0		26.4	28.1		28.3	30.4	8.5
Level of Service	B	B	B	C	D		C	C		C	C	A
Approach Delay (s)		17.4			36.2			27.7			15.3	
Approach LOS		B			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 AWSC
8: Old Redwood Highway #1 & William Street/George Street

8/21/2014

Intersection	
Intersection Delay, s/veh	19.9
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	59	1	12	0	15	2	23	0	11	504	2
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	65	1	13	0	16	2	25	0	12	554	2
Number of Lanes	0	0	1	0	0	0	1	0	0	1	2	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	1
HCM Control Delay	12.2	11	15.7
HCM LOS	B	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	82%	38%	100%	0%	0%
Vol Thru, %	0%	100%	99%	1%	5%	0%	100%	88%
Vol Right, %	0%	0%	1%	17%	57%	0%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	11	336	170	72	40	6	475	269
LT Vol	0	336	168	1	2	0	475	237
Through Vol	0	0	2	12	23	0	0	32
RT Vol	11	0	0	59	15	6	0	0
Lane Flow Rate	12	369	187	79	44	7	522	296
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.022	0.617	0.312	0.172	0.091	0.011	0.83	0.464
Departure Headway (Hd)	6.524	6.018	6.01	7.844	7.468	6.235	5.73	5.646
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	548	598	598	457	479	574	631	636
Service Time	4.27	3.765	3.756	5.605	5.233	3.975	3.47	3.386
HCM Lane V/C Ratio	0.022	0.617	0.313	0.173	0.092	0.012	0.827	0.465
HCM Control Delay	9.4	18	11.5	12.2	11	9	30.4	13.2
HCM Lane LOS	A	C	B	B	B	A	D	B
HCM 95th-tile Q	0.1	4.2	1.3	0.6	0.3	0	8.8	2.5

HCM 2010 AWSC
8: Old Redwood Highway #1 & William Street/George Street

8/21/2014

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	6	712	32
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	7	782	35
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	24.1
HCM LOS	C

Lane

HCM Signalized Intersection Capacity Analysis
9: Old Redwood Highway #2/Old Redwood Highway #1 & West Sierra Avenue #4/East Cotati Avenue #3

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	157	2	4	294	287	8	174	5	397	237	86
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
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.98		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	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	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1521	1770	3201		1770	3520		1770	1863	1528
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1521	1770	3201		1770	3520		1770	1863	1528
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	66	165	2	4	309	302	8	183	5	418	249	91
RTOR Reduction (vph)	0	0	1	0	179	0	0	2	0	0	0	48
Lane Group Flow (vph)	66	165	1	4	432	0	8	186	0	418	249	43
Confl. Peds. (#/hr)			6			25			13			18
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	6.1	23.7	23.7	0.9	18.5		0.6	14.9		22.4	36.7	36.7
Effective Green, g (s)	6.1	23.7	23.7	0.9	18.5		0.6	14.9		22.4	36.7	36.7
Actuated g/C Ratio	0.08	0.30	0.30	0.01	0.24		0.01	0.19		0.29	0.47	0.47
Clearance 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)	138	566	462	20	760		13	673		508	877	719
v/s Ratio Prot	c0.04	0.09		0.00	c0.13		0.00	0.05		c0.24	c0.13	
v/s Ratio Perm			0.00									0.03
v/c Ratio	0.48	0.29	0.00	0.20	0.57		0.62	0.28		0.82	0.28	0.06
Uniform Delay, d1	34.4	20.7	18.9	38.1	26.2		38.5	26.9		25.9	12.6	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	0.3	0.0	4.9	1.0		64.0	0.2		10.4	0.2	0.0
Delay (s)	37.0	21.0	18.9	43.0	27.2		102.6	27.1		36.3	12.8	11.2
Level of Service	D	C	B	D	C		F	C		D	B	B
Approach Delay (s)		25.5			27.3			30.2			25.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	77.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	66.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	23	17	39	0	159	14	11	0	11	200	63
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	24	18	41	0	169	15	12	0	12	213	67
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	9.3	11.2	10.7
HCM LOS	A	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	0%	29%	86%	3%
Vol Thru, %	95%	0%	22%	8%	94%
Vol Right, %	0%	100%	49%	6%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	211	63	79	184	243
LT Vol	200	0	17	14	228
Through Vol	0	63	39	11	8
RT Vol	11	0	23	159	7
Lane Flow Rate	224	67	84	196	259
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.355	0.092	0.128	0.307	0.378
Departure Headway (Hd)	5.692	4.957	5.499	5.645	5.262
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	633	723	651	636	685
Service Time	3.418	2.683	3.537	3.677	3.289
HCM Lane V/C Ratio	0.354	0.093	0.129	0.308	0.378
HCM Control Delay	11.5	8.2	9.3	11.2	11.5
HCM Lane LOS	B	A	A	B	B
HCM 95th-tile Q	1.6	0.3	0.4	1.3	1.8

HCM 2010 AWSC
10: Old Redwood Highway #2 & Henry Street/Charles Street 8/21/2014

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	7	228	8
Peak Hour Factor	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	7	243	9
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11.5
HCM LOS	B

Lane

Cotati General Plan Update
AM Peak Hour - Future No Project

HCM Signalized Intersection Capacity Analysis
11: Old Redwood Highway/Old Redwood Highway #2 & Valparaiso Avenue/Myrtle Avenue

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	40	50	163	49	26	29	258	105	43	351	3
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
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1680		1770	1743		1770	1863	1539	1770	1863	1532
Flt Permitted	0.71	1.00		0.70	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1316	1680		1298	1743		1770	1863	1539	1770	1863	1532
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	6	41	52	168	51	27	30	266	108	44	362	3
RTOR Reduction (vph)	0	37	0	0	18	0	0	0	64	0	0	2
Lane Group Flow (vph)	6	56	0	168	60	0	30	266	44	44	362	1
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	13.2	13.2		13.2	13.2		2.3	18.6	18.6	1.8	18.1	18.1
Effective Green, g (s)	13.2	13.2		13.2	13.2		2.3	18.6	18.6	1.8	18.1	18.1
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.05	0.41	0.41	0.04	0.40	0.40
Clearance 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)	380	486		375	504		89	759	627	69	739	608
v/s Ratio Prot		0.03			0.03		0.02	0.14		c0.02	c0.19	
v/s Ratio Perm	0.00			c0.13					0.03			0.00
v/c Ratio	0.02	0.12		0.45	0.12		0.34	0.35	0.07	0.64	0.49	0.00
Uniform Delay, d1	11.6	11.9		13.2	11.9		20.9	9.3	8.2	21.6	10.3	8.3
Progression Factor	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	0.1		0.9	0.1		2.2	0.3	0.0	17.7	0.5	0.0
Delay (s)	11.6	12.0		14.1	12.0		23.2	9.6	8.3	39.3	10.8	8.3
Level of Service	B	B		B	B		C	A	A	D	B	A
Approach Delay (s)		12.0			13.4			10.3			13.9	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	45.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	47.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
12: SB US 101 On-ramp/West School Road & West Sierra Avenue #4

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	144	25	265	237	20	0	0	0	29	15	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	160	28	294	263	22	0	0	0	32	17	4
Pedestrians		1									1	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	287			160			1055	1054	174	1043	1029	276
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	287			160			1055	1054	174	1043	1029	276
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			79			100	100	100	81	91	99
cM capacity (veh/h)	1274			1419			158	179	870	174	185	761

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	190	580	53
Volume Left	2	294	32
Volume Right	28	22	4
cSH	1274	1419	190
Volume to Capacity	0.00	0.21	0.28
Queue Length 95th (ft)	0	20	28
Control Delay (s)	0.1	5.2	31.3
Lane LOS	A	A	D
Approach Delay (s)	0.1	5.2	31.3
Approach LOS			D

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: NB US 101 Off-ramp & West Sierra Avenue #4

8/21/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	173	0	0	492	30	319
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	211	0	0	600	37	389
Pedestrians	1			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			211		812	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			211		812	212
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		89	53
cM capacity (veh/h)			1360		348	827

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	211	600	37	389
Volume Left	0	0	37	0
Volume Right	0	0	0	389
cSH	1700	1700	348	827
Volume to Capacity	0.12	0.35	0.11	0.47
Queue Length 95th (ft)	0	0	9	64
Control Delay (s)	0.0	0.0	16.6	13.2
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	13.4	
Approach LOS			B	

Intersection Summary			
Average Delay		4.6	
Intersection Capacity Utilization		36.2%	ICU Level of Service	A
Analysis Period (min)		15	

HCM 2010 AWSC
14: West Sierra Avenue #4 & East School Street

8/21/2014

Intersection	
Intersection Delay, s/veh	12.2
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Vol, veh/h	0	10	346	0	355	12	0	14	15
Peak Hour Factor	0.92	0.85	0.85	0.92	0.85	0.85	0.92	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	12	407	0	418	14	0	16	18
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	12.3	12.4	8.9
HCM LOS	B	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	0%	48%
Vol Thru, %	97%	97%	0%
Vol Right, %	0%	3%	52%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	356	367	29
LT Vol	346	355	0
Through Vol	0	12	15
RT Vol	10	0	14
Lane Flow Rate	419	432	34
Geometry Grp	1	1	1
Degree of Util (X)	0.52	0.532	0.052
Departure Headway (Hd)	4.473	4.438	5.527
Convergence, Y/N	Yes	Yes	Yes
Cap	808	812	645
Service Time	2.497	2.461	3.583
HCM Lane V/C Ratio	0.519	0.532	0.053
HCM Control Delay	12.3	12.4	8.9
HCM Lane LOS	B	B	A
HCM 95th-tile Q	3.1	3.2	0.2

HCM Unsignalized Intersection Capacity Analysis
15: Charles Street & East Cotati Avenue #3

8/21/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	660	3	189	665	1	86
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	702	3	201	707	1	91
Pedestrians	11			10	11	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	759					
pX, platoon unblocked			0.99		0.99	0.99
vC, conflicting volume			716		1835	725
vC1, stage 1 conf vol					715	
vC2, stage 2 conf vol					1121	
vCu, unblocked vol			709		1838	717
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			77		100	78
cM capacity (veh/h)			874		213	418

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	705	201	707	93
Volume Left	0	201	0	1
Volume Right	3	0	0	91
cSH	1700	874	1700	413
Volume to Capacity	0.41	0.23	0.42	0.22
Queue Length 95th (ft)	0	22	0	21
Control Delay (s)	0.0	10.3	0.0	16.2
Lane LOS		B		C
Approach Delay (s)	0.0	2.3		16.2
Approach LOS				C

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		63.8%	ICU Level of Service	B
Analysis Period (min)		15	

HCM 2010 AWSC
16: Lasalle Avenue & East Cotati Avenue #3

8/21/2014

Intersection	
Intersection Delay, s/veh	33.3
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	11	596	109	0	53	771	6	0	137	1	38
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	12	641	117	0	57	829	6	0	147	1	41
Number of Lanes	0	1	2	0	0	1	2	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	3
HCM Control Delay	24.6	44.4	17.4
HCM LOS	C	E	C

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	78%	100%	0%	0%	100%	0%	0%	0%
Vol Thru, %	1%	0%	100%	65%	0%	100%	98%	17%
Vol Right, %	22%	0%	0%	35%	0%	0%	2%	83%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	176	11	397	308	53	514	263	6
LT Vol	1	0	397	199	0	514	257	1
Through Vol	38	0	0	109	0	0	6	5
RT Vol	137	11	0	0	53	0	0	0
Lane Flow Rate	189	12	427	331	57	553	283	6
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.438	0.023	0.788	0.587	0.111	0.995	0.508	0.015
Departure Headway (Hd)	8.331	7.257	6.746	6.493	7.095	6.586	6.569	8.261
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	435	496	538	559	508	553	551	435
Service Time	6.031	4.957	4.446	4.193	4.795	4.286	4.269	5.972
HCM Lane V/C Ratio	0.434	0.024	0.794	0.592	0.112	1	0.514	0.014
HCM Control Delay	17.4	10.1	30.1	18	10.7	62.5	15.9	11.1
HCM Lane LOS	C	B	D	C	B	F	C	B
HCM 95th-tile Q	2.2	0.1	7.3	3.8	0.4	14.1	2.9	0

HCM 2010 AWSC
16: Lasalle Avenue & East Cotati Avenue #3

8/21/2014

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	0	1	5
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	0	1	5
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	11.1
HCM LOS	B

Lane

HCM Signalized Intersection Capacity Analysis
17: East Cotati Avenue #3 & Adrian Drive

8/21/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	86	391	686	131	116	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3429		1770	1522
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3429		1770	1522
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	100	455	798	152	135	209
RTOR Reduction (vph)	0	0	15	0	0	158
Lane Group Flow (vph)	100	455	935	0	135	51
Confl. Peds. (#/hr)	17			11	11	17
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	7.7	43.1	31.4		11.5	11.5
Effective Green, g (s)	7.7	43.1	31.4		11.5	11.5
Actuated g/C Ratio	0.12	0.69	0.50		0.18	0.18
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	217	2436	1719		325	279
v/s Ratio Prot	c0.06	0.13	c0.27		c0.08	
v/s Ratio Perm						0.03
v/c Ratio	0.46	0.19	0.54		0.42	0.18
Uniform Delay, d1	25.5	3.5	10.7		22.6	21.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	0.0	0.4		0.9	0.3
Delay (s)	27.1	3.5	11.0		23.4	21.9
Level of Service	C	A	B		C	C
Approach Delay (s)		7.8	11.0		22.5	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	62.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
18: Lancaster Drive & East Cotati Avenue #3

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	437	86	114	760	3	124	1	222	9	1	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	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	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.96	1.00	0.95	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			0.98	1.00	0.98	1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1747	3412		1770	3536			1744	1512	1737	1528	
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00	0.67	1.00	
Satd. Flow (perm)	1747	3412		1770	3536			1310	1512	1218	1528	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	10	497	98	130	864	3	141	1	252	10	1	16
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	196	0	12	0
Lane Group Flow (vph)	10	578	0	130	867	0	0	142	56	10	5	0
Confl. Peds. (#/hr)	28		23	24		29	23		24	29		28
Confl. Bikes (#/hr)			15			15			15			15
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	0.9	22.6		8.0	29.7			12.1	12.1	12.1	12.1	
Effective Green, g (s)	0.9	22.6		8.0	29.7			12.1	12.1	12.1	12.1	
Actuated g/C Ratio	0.02	0.41		0.15	0.54			0.22	0.22	0.22	0.22	
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)	28	1409		258	1919			289	334	269	338	
v/s Ratio Prot	0.01	0.17		c0.07	c0.25						0.00	
v/s Ratio Perm								c0.11	0.04	0.01		
v/c Ratio	0.36	0.41		0.50	0.45			0.49	0.17	0.04	0.01	
Uniform Delay, d1	26.6	11.3		21.5	7.6			18.6	17.2	16.7	16.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.7	0.2		1.5	0.2			1.3	0.2	0.1	0.0	
Delay (s)	34.3	11.5		23.1	7.7			19.9	17.5	16.8	16.7	
Level of Service	C	B		C	A			B	B	B	B	
Approach Delay (s)		11.9			9.7			18.4			16.7	
Approach LOS		B			A			B			B	

Intersection Summary				
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	54.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	53.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
19: Santero Way & East Cotati Avenue #3/East Cotati Avenue

8/21/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	525	14	19	882	25	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	640	17	23	1076	30	20
Pedestrians	5			5	5	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1160					
pX, platoon unblocked						
vC, conflicting volume			662		1243	339
vC1, stage 1 conf vol					654	
vC2, stage 2 conf vol					589	
vCu, unblocked vol			662		1243	339
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		92	97
cM capacity (veh/h)			918		371	652

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	427	230	23	538	538	50
Volume Left	0	0	23	0	0	30
Volume Right	0	17	0	0	0	20
cSH	1700	1700	918	1700	1700	446
Volume to Capacity	0.25	0.14	0.03	0.32	0.32	0.11
Queue Length 95th (ft)	0	0	2	0	0	9
Control Delay (s)	0.0	0.0	9.0	0.0	0.0	14.1
Lane LOS			A			B
Approach Delay (s)	0.0		0.2			14.1
Approach LOS						B

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	35.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
20: Madrone Avenue & Gravenstein Highway/Gravenstein Hwy #5 8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	480	30	114	464	1	17	1	150	5	1	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			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)	1	522	33	124	504	1	18	1	163	5	1	2
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	505			554			1293	1293	538	1277	1309	505
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	505			554			1293	1293	538	1277	1309	505
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			85	99	70	94	99	100
cM capacity (veh/h)	1059			1016			125	143	543	90	140	567

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1	554	124	505	183	9
Volume Left	1	0	124	0	18	5
Volume Right	0	33	0	1	163	2
cSH	1059	1700	1016	1700	401	121
Volume to Capacity	0.00	0.33	0.12	0.30	0.46	0.07
Queue Length 95th (ft)	0	0	10	0	58	6
Control Delay (s)	8.4	0.0	9.0	0.0	21.3	37.0
Lane LOS	A		A		C	E
Approach Delay (s)	0.0		1.8		21.3	37.0
Approach LOS					C	E

Intersection Summary				
Average Delay		3.9		
Intersection Capacity Utilization		53.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
1: Alder Ave/Alder Avenue & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	779	0	0	969	11	0	0	0	8	0	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	820	0	0	1020	12	0	0	0	8	0	17
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	1032			820			1886	1875	820	1869	1869	1026
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1032			820			1886	1875	820	1869	1869	1026
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	85	100	94
cM capacity (veh/h)	674			809			50	70	375	55	71	285

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	832	1032	0	25
Volume Left	12	0	0	8
Volume Right	0	12	0	17
cSH	674	809	1700	118
Volume to Capacity	0.02	0.00	0.00	0.21
Queue Length 95th (ft)	1	0	0	19
Control Delay (s)	0.5	0.0	0.0	43.5
Lane LOS	A		A	E
Approach Delay (s)	0.5	0.0	0.0	43.5
Approach LOS			A	E

Intersection Summary				
Average Delay		0.8		
Intersection Capacity Utilization		61.7%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: West Cotati Avenue & Gravenstein Hwy #5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	770	9	53	966	3	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	811	9	56	1017	9	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1261		
pX, platoon unblocked					0.73	
vC, conflicting volume			811		1944	815
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			811		2108	815
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		75	91
cM capacity (veh/h)			815		38	377

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	820	1073	43
Volume Left	0	56	9
Volume Right	9	0	34
cSH	1700	815	174
Volume to Capacity	0.48	0.07	0.25
Queue Length 95th (ft)	0	5	23
Control Delay (s)	0.0	2.1	40.1
Lane LOS		A	E
Approach Delay (s)	0.0	2.1	40.1
Approach LOS			E

Intersection Summary				
Average Delay		2.0		
Intersection Capacity Utilization		104.1%	ICU Level of Service	G
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
3: Gravenstein Hwy #5 & Redwood Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	621	36	43	661	284	39	14	52	403	21	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	16	16
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		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	0.96		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.88		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (prot)	1770	3378		1770	3406	1569	1770	1583		1681	1719	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (perm)	1770	3378		1770	3406	1569	1770	1583		1681	1719	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	654	38	45	696	299	41	15	55	424	22	286
RTOR Reduction (vph)	0	5	0	0	0	99	0	52	0	0	177	0
Lane Group Flow (vph)	137	687	0	45	696	200	41	18	0	382	173	0
Confl. Peds. (#/hr)			4			2			2			4
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2		1	6	7	8	8		7	7	
Permitted Phases						6						
Actuated Green, G (s)	12.4	28.3		22.2	38.1	66.8	4.8	4.8		28.7	28.7	
Effective Green, g (s)	12.4	28.3		22.2	38.1	66.8	4.8	4.8		28.7	28.7	
Actuated g/C Ratio	0.12	0.28		0.22	0.38	0.67	0.05	0.05		0.29	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)	219	955		392	1297	1048	84	75		482	493	
v/s Ratio Prot	0.08	c0.20		0.03	c0.20	0.05	c0.02	0.01		c0.23	0.10	
v/s Ratio Perm						0.07						
v/c Ratio	0.63	0.72		0.11	0.54	0.19	0.49	0.24		0.79	0.35	
Uniform Delay, d1	41.6	32.3		31.1	24.1	6.3	46.4	45.8		32.9	28.3	
Progression Factor	1.00	1.00		0.93	0.90	1.19	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.5	2.6		0.6	1.5	0.1	4.4	1.6		8.7	0.4	
Delay (s)	47.1	34.9		29.4	23.1	7.6	50.8	47.4		41.6	28.7	
Level of Service	D	C		C	C	A	D	D		D	C	
Approach Delay (s)		36.9			18.9			48.7			35.4	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	591	447	94	728	0	0	0	0	479	1	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	15	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3406	1638	1770	3406					3433	1499	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3406	1638	1770	3406					3433	1499	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	622	471	99	766	0	0	0	0	504	1	225
RTOR Reduction (vph)	0	0	231	0	0	0	0	0	0	0	174	0
Lane Group Flow (vph)	0	622	240	99	766	0	0	0	0	504	52	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			5									5
Heavy Vehicles (%)	2%	6%	6%	2%	6%	6%	6%	6%	6%	2%	2%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		51.0	51.0	14.4	69.4					22.6	22.6	
Effective Green, g (s)		51.0	51.0	14.4	69.4					22.6	22.6	
Actuated g/C Ratio		0.51	0.51	0.14	0.69					0.23	0.23	
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)		1737	835	254	2363					775	338	
v/s Ratio Prot		c0.18		c0.06	0.22					c0.15	0.03	
v/s Ratio Perm			0.15									
v/c Ratio		0.36	0.29	0.39	0.32					0.65	0.15	
Uniform Delay, d1		14.7	14.1	38.8	6.0					35.1	31.0	
Progression Factor		0.60	1.37	1.09	0.95					1.00	1.00	
Incremental Delay, d2		0.5	0.7	1.0	0.4					2.0	0.2	
Delay (s)		9.4	20.0	43.5	6.1					37.1	31.2	
Level of Service		A	C	D	A					D	C	
Approach Delay (s)		13.9			10.4			0.0			35.3	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1042	0	0	557	265	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.91	0.97	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3406			5085	3303	1548
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3406			5085	3303	1548
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1097	0	0	586	279	320
RTOR Reduction (vph)	0	0	0	0	0	59
Lane Group Flow (vph)	1097	0	0	586	279	261
Confl. Peds. (#/hr)						5
Confl. Bikes (#/hr)						5
Heavy Vehicles (%)	6%	2%	2%	2%	6%	2%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	68.1			68.1	23.9	23.9
Effective Green, g (s)	68.1			68.1	23.9	23.9
Actuated g/C Ratio	0.68			0.68	0.24	0.24
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)	2319			3462	789	369
v/s Ratio Prot	c0.32			0.12	0.08	
v/s Ratio Perm						c0.17
v/c Ratio	0.47			0.17	0.35	0.71
Uniform Delay, d1	7.5			5.8	31.6	34.9
Progression Factor	0.19			0.47	1.00	1.00
Incremental Delay, d2	0.6			0.1	0.3	6.1
Delay (s)	2.0			2.8	31.9	41.0
Level of Service	A			A	C	D
Approach Delay (s)	2.0			2.8	36.7	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Old Redwood Highway #1/NB US 101 On-ramp & Commerce Boulevard

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	412	47	405	677	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	4.0	4.0	4.5	4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00		
Frt	1.00	0.85	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1888	1689	1827	1583		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1888	1689	1827	1583		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	438	50	431	720	0	0
RTOR Reduction (vph)	0	31	0	0	0	0
Lane Group Flow (vph)	438	19	431	720	0	0
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%
Turn Type	Prot	Perm	NA	Free		
Protected Phases	7		6			
Permitted Phases		7		Free		
Actuated Green, G (s)	16.3	16.3	17.3	42.1		
Effective Green, g (s)	16.3	16.3	17.3	42.1		
Actuated g/C Ratio	0.39	0.39	0.41	1.00		
Clearance Time (s)	4.0	4.0	4.5			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	730	653	750	1583		
v/s Ratio Prot	c0.23		c0.24			
v/s Ratio Perm		0.01		0.45		
v/c Ratio	0.60	0.03	0.57	0.45		
Uniform Delay, d1	10.3	8.0	9.6	0.0		
Progression Factor	1.00	1.00	1.00	1.00		
Incremental Delay, d2	1.3	0.0	1.1	0.9		
Delay (s)	11.6	8.0	10.6	0.9		
Level of Service	B	A	B	A		
Approach Delay (s)	11.3		4.6			0.0
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	42.1	Sum of lost time (s)	8.5
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Old Redwood Highway #1 & Gravenstein Hwy #5/Gravenstein Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	517	99	685	37	59	50	272	526	41	20	153	224
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
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.91	0.91		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.98		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	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	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	1863	1549	1770	1698		1610	3335		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	1863	1549	1770	1698		1610	3335		1770	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	544	104	721	39	62	53	286	554	43	21	161	236
RTOR Reduction (vph)	0	0	468	0	31	0	0	5	0	0	0	0
Lane Group Flow (vph)	544	104	253	39	84	0	257	621	0	21	161	236
Confl. Peds. (#/hr)			5			6			9			2
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA		Split	NA		Split	NA	pt+ov
Protected Phases	8	8		7	7		6	6		5	5	5 8
Permitted Phases			8									
Actuated Green, G (s)	35.1	35.1	35.1	8.7	8.7		25.1	25.1		15.1	15.1	54.2
Effective Green, g (s)	35.1	35.1	35.1	8.7	8.7		25.1	25.1		15.1	15.1	54.2
Actuated g/C Ratio	0.35	0.35	0.35	0.09	0.09		0.25	0.25		0.15	0.15	0.54
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)	1181	653	543	153	147		404	837		267	281	857
v/s Ratio Prot	0.16	0.06		0.02	c0.05		0.16	c0.19		0.01	c0.09	0.15
v/s Ratio Perm			c0.16									
v/c Ratio	0.46	0.16	0.47	0.25	0.57		0.64	0.74		0.08	0.57	0.28
Uniform Delay, d1	25.1	22.3	25.2	42.6	43.9		33.4	34.5		36.5	39.5	12.3
Progression Factor	0.64	0.62	2.10	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	0.5	2.5	0.9	5.3		3.3	3.6		0.1	2.8	0.2
Delay (s)	17.2	14.3	55.5	43.5	49.1		36.6	38.0		36.6	42.3	12.5
Level of Service	B	B	E	D	D		D	D		D	D	B
Approach Delay (s)		37.1			47.7			37.6			25.2	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 AWSC
8: Old Redwood Highway #1 & William Street/George Street

Intersection	
Intersection Delay, s/veh	33.6
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	68	2	25	0	5	1	30	0	12	744	8
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	72	2	26	0	5	1	32	0	13	783	8
Number of Lanes	0	0	1	0	0	0	1	0	0	1	2	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	1
HCM Control Delay	13.6	11.4	33.9
HCM LOS	B	B	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	72%	14%	100%	0%	0%
Vol Thru, %	0%	100%	97%	2%	3%	0%	100%	84%
Vol Right, %	0%	0%	3%	26%	83%	0%	0%	16%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	496	256	95	36	28	523	309
LT Vol	0	496	248	2	1	0	523	261
Through Vol	0	0	8	25	30	0	0	48
RT Vol	12	0	0	68	5	28	0	0
Lane Flow Rate	13	522	269	100	38	29	550	326
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.024	0.914	0.47	0.23	0.084	0.055	0.946	0.55
Departure Headway (Hd)	6.808	6.302	6.28	8.37	7.943	6.695	6.189	6.079
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	523	574	571	432	454	532	583	589
Service Time	4.589	4.082	4.059	6.07	5.643	4.473	3.966	3.856
HCM Lane V/C Ratio	0.025	0.909	0.471	0.231	0.084	0.055	0.943	0.553
HCM Control Delay	9.8	44.5	14.6	13.6	11.4	9.9	49.9	16.1
HCM Lane LOS	A	E	B	B	B	A	E	C
HCM 95th-tile Q	0.1	11.2	2.5	0.9	0.3	0.2	12.5	3.3

HCM 2010 AWSC
8: Old Redwood Highway #1 & William Street/George Street

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	28	784	48
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	29	825	51
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	36.4
HCM LOS	E

Lane

HCM Signalized Intersection Capacity Analysis
9: Old Redwood Highway #2/Old Redwood Highway #1 & West Sierra Avenue #4/East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	99	282	3	16	191	345	2	321	3	394	231	49
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
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.97		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	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	0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1520	1770	3098		1770	3533		1770	1863	1527
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1520	1770	3098		1770	3533		1770	1863	1527
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	105	300	3	17	203	367	2	341	3	419	246	52
RTOR Reduction (vph)	0	0	2	0	291	0	0	1	0	0	0	26
Lane Group Flow (vph)	105	300	1	17	279	0	2	343	0	419	246	26
Confl. Peds. (#/hr)			6			25			13			18
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	7.7	23.0	23.0	1.2	16.5		0.6	17.1		22.9	39.4	39.4
Effective Green, g (s)	7.7	23.0	23.0	1.2	16.5		0.6	17.1		22.9	39.4	39.4
Actuated g/C Ratio	0.10	0.29	0.29	0.01	0.21		0.01	0.21		0.29	0.49	0.49
Clearance 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)	169	534	435	26	637		13	753		505	915	750
v/s Ratio Prot	c0.06	c0.16		0.01	0.09		0.00	c0.10		c0.24	0.13	
v/s Ratio Perm			0.00									0.02
v/c Ratio	0.62	0.56	0.00	0.65	0.44		0.15	0.46		0.83	0.27	0.03
Uniform Delay, d1	34.8	24.3	20.4	39.3	27.8		39.5	27.5		26.8	12.0	10.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.9	1.4	0.0	46.4	0.5		5.5	0.4		10.8	0.2	0.0
Delay (s)	41.8	25.7	20.4	85.7	28.3		45.0	27.9		37.7	12.1	10.6
Level of Service	D	C	C	F	C		D	C		D	B	B
Approach Delay (s)		29.8			29.9			28.0			26.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	12.3
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	15	24	26	0	95	16	20	0	17	296	183
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	17	27	30	0	108	18	23	0	19	336	208
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	9.9	11.1	13
HCM LOS	A	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	0%	23%	73%	13%
Vol Thru, %	95%	0%	37%	12%	81%
Vol Right, %	0%	100%	40%	15%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	313	183	65	131	241
LT Vol	296	0	24	16	195
Through Vol	0	183	26	20	14
RT Vol	17	0	15	95	32
Lane Flow Rate	356	208	74	149	274
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.552	0.28	0.123	0.251	0.411
Departure Headway (Hd)	5.586	4.852	6.016	6.072	5.402
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	647	740	595	591	665
Service Time	3.314	2.579	4.063	4.112	3.433
HCM Lane V/C Ratio	0.55	0.281	0.124	0.252	0.412
HCM Control Delay	15	9.5	9.9	11.1	12.2
HCM Lane LOS	B	A	A	B	B
HCM 95th-tile Q	3.4	1.1	0.4	1	2

HCM 2010 AWSC
10: Old Redwood Highway #2 & Henry Street/Charles Street

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	32	195	14
Peak Hour Factor	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	36	222	16
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	12.2
HCM LOS	B

Lane

Cotati General Plan Update
PM Peak Hour - Future No Project

HCM Signalized Intersection Capacity Analysis
11: Old Redwood Highway/Old Redwood Highway #2 & Valparaiso Avenue/Myrtle Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	70	20	56	29	50	25	398	153	74	203	10
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
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1786		1770	1639		1770	1863	1540	1770	1863	1533
Flt Permitted	0.70	1.00		0.69	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1307	1786		1293	1639		1770	1863	1540	1770	1863	1533
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	6	75	22	60	31	54	27	428	165	80	218	11
RTOR Reduction (vph)	0	13	0	0	45	0	0	0	82	0	0	5
Lane Group Flow (vph)	6	85	0	60	40	0	27	428	83	80	218	6
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	8.4	8.4		8.4	8.4		1.0	25.3	25.3	4.7	29.0	29.0
Effective Green, g (s)	8.4	8.4		8.4	8.4		1.0	25.3	25.3	4.7	29.0	29.0
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.02	0.50	0.50	0.09	0.58	0.58
Clearance 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)	217	297		215	273		35	935	773	165	1071	882
v/s Ratio Prot		c0.05			0.02		0.02	c0.23		c0.05	c0.12	
v/s Ratio Perm	0.00			0.05					0.05			0.00
v/c Ratio	0.03	0.28		0.28	0.15		0.77	0.46	0.11	0.48	0.20	0.01
Uniform Delay, d1	17.6	18.4		18.4	17.9		24.6	8.1	6.6	21.7	5.1	4.6
Progression Factor	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	0.5		0.7	0.2		67.0	0.4	0.1	2.2	0.1	0.0
Delay (s)	17.6	18.9		19.1	18.2		91.6	8.5	6.7	23.9	5.2	4.6
Level of Service	B	B		B	B		F	A	A	C	A	A
Approach Delay (s)		18.8			18.6			11.6			10.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
12: SB US 101 On-ramp/West School Road & West Sierra Avenue #4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	147	12	125	173	43	0	0	0	18	3	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	163	13	139	192	48	0	0	0	20	3	1
Pedestrians		1									1	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	241			163			672	693	170	669	663	218
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	241			163			672	693	170	669	663	218
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			100	100	100	94	99	100
cM capacity (veh/h)	1324			1415			338	330	874	342	343	820

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	179	379	24
Volume Left	2	139	20
Volume Right	13	48	1
cSH	1324	1415	352
Volume to Capacity	0.00	0.10	0.07
Queue Length 95th (ft)	0	8	6
Control Delay (s)	0.1	3.4	16.0
Lane LOS	A	A	C
Approach Delay (s)	0.1	3.4	16.0
Approach LOS			C

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: NB US 101 Off-ramp & West Sierra Avenue #4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	165	0	0	300	41	289
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	174	0	0	316	43	304
Pedestrians	1			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			174		490	175
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			174		490	175
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		92	65
cM capacity (veh/h)			1403		537	868

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	174	316	43	304
Volume Left	0	0	43	0
Volume Right	0	0	0	304
cSH	1700	1700	537	868
Volume to Capacity	0.10	0.19	0.08	0.35
Queue Length 95th (ft)	0	0	7	40
Control Delay (s)	0.0	0.0	12.3	11.4
Lane LOS			B	B
Approach Delay (s)	0.0	0.0	11.5	
Approach LOS			B	

Intersection Summary			
Average Delay		4.8	
Intersection Capacity Utilization		33.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM 2010 AWSC
14: West Sierra Avenue #4 & East School Street

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Vol, veh/h	0	23	374	0	257	30	0	27	10
Peak Hour Factor	0.92	0.95	0.95	0.92	0.95	0.95	0.92	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	24	394	0	271	32	0	28	11
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	11.8	10	8.8
HCM LOS	B	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	73%
Vol Thru, %	94%	90%	0%
Vol Right, %	0%	10%	27%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	397	287	37
LT Vol	374	257	0
Through Vol	0	30	10
RT Vol	23	0	27
Lane Flow Rate	418	302	39
Geometry Grp	1	1	1
Degree of Util (X)	0.506	0.369	0.059
Departure Headway (Hd)	4.36	4.402	5.458
Convergence, Y/N	Yes	Yes	Yes
Cap	827	819	655
Service Time	2.379	2.421	3.499
HCM Lane V/C Ratio	0.505	0.369	0.06
HCM Control Delay	11.8	10	8.8
HCM Lane LOS	B	A	A
HCM 95th-tile Q	2.9	1.7	0.2

HCM Unsignalized Intersection Capacity Analysis
15: Charles Street & East Cotati Avenue #3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	789	9	119	569	6	238
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	839	10	127	605	6	253
Pedestrians	11			10	11	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	759					
pX, platoon unblocked			0.89		0.89	0.89
vC, conflicting volume			860		1725	865
vC1, stage 1 conf vol					855	
vC2, stage 2 conf vol					870	
vCu, unblocked vol			779		1753	785
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			83		98	26
cM capacity (veh/h)			737		259	343

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	849	127	605	260
Volume Left	0	127	0	6
Volume Right	10	0	0	253
cSH	1700	737	1700	340
Volume to Capacity	0.50	0.17	0.36	0.76
Queue Length 95th (ft)	0	15	0	151
Control Delay (s)	0.0	10.9	0.0	42.8
Lane LOS		B		E
Approach Delay (s)	0.0	1.9		42.8
Approach LOS				E

Intersection Summary			
Average Delay		6.8	
Intersection Capacity Utilization		74.7%	ICU Level of Service D
Analysis Period (min)		15	

HCM 2010 AWSC
16: Lasalle Avenue & East Cotati Avenue #3

Intersection	
Intersection Delay, s/veh	40.7
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	3	874	165	0	64	557	3	0	161	0	68
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	940	177	0	69	599	3	0	173	0	73
Number of Lanes	0	1	2	0	0	1	2	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	3
HCM Control Delay	55.2	24.4	21.2
HCM LOS	F	C	C

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	70%	100%	0%	0%	100%	0%	0%	35%
Vol Thru, %	0%	0%	100%	64%	0%	100%	98%	6%
Vol Right, %	30%	0%	0%	36%	0%	0%	2%	59%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	229	3	583	456	64	371	189	17
LT Vol	0	0	583	291	0	371	186	1
Through Vol	68	0	0	165	0	0	3	10
RT Vol	161	3	0	0	64	0	0	6
Lane Flow Rate	246	3	627	491	69	399	203	18
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.564	0.007	1	0.895	0.145	0.788	0.4	0.044
Departure Headway (Hd)	8.249	7.337	6.824	6.565	7.605	7.104	7.093	8.672
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	436	486	533	550	471	507	507	412
Service Time	6.009	5.104	4.591	4.331	5.367	4.866	4.855	6.449
HCM Lane V/C Ratio	0.564	0.006	1.176	0.893	0.146	0.787	0.4	0.044
HCM Control Delay	21.2	10.2	65.3	42.5	11.7	31.6	14.5	11.9
HCM Lane LOS	C	B	F	E	B	D	B	B
HCM 95th-tile Q	3.4	0	14	10.4	0.5	7.2	1.9	0.1

HCM 2010 AWSC
16: Lasalle Avenue & East Cotati Avenue #3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	6	1	10
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	6	1	11
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	11.9
HCM LOS	B

Lane

HCM Signalized Intersection Capacity Analysis
17: East Cotati Avenue #3 & Adrian Drive

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	119	808	520	80	115	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3444		1770	1504
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3444		1770	1504
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	128	869	559	86	124	113
RTOR Reduction (vph)	0	0	7	0	0	91
Lane Group Flow (vph)	128	869	638	0	124	22
Confl. Peds. (#/hr)	17			11	11	17
Confl. Bikes (#/hr)				10		10
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	12.0	73.2	57.2		12.6	12.6
Effective Green, g (s)	12.0	73.2	57.2		12.6	12.6
Actuated g/C Ratio	0.13	0.78	0.61		0.13	0.13
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	226	2761	2100		237	202
v/s Ratio Prot	c0.07	c0.25	0.19		c0.07	
v/s Ratio Perm						0.01
v/c Ratio	0.57	0.31	0.30		0.52	0.11
Uniform Delay, d1	38.5	3.0	8.8		37.8	35.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.2	0.3	0.4		2.1	0.2
Delay (s)	41.7	3.3	9.1		39.9	35.9
Level of Service	D	A	A		D	D
Approach Delay (s)		8.2	9.1		38.0	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	93.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
18: Lancaster Drive & East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	769	159	138	540	8	97	0	139	1	0	5
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	0.95			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.95	1.00	0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98	1.00	0.98	1.00	
Frt	1.00	0.97		1.00	1.00			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	3404		1770	3526			1730	1497	1726	1491	
Flt Permitted	0.95	1.00		0.95	1.00			0.75	1.00	0.69	1.00	
Satd. Flow (perm)	1770	3404		1770	3526			1374	1497	1254	1491	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	818	169	147	574	9	103	0	148	1	0	5
RTOR Reduction (vph)	0	17	0	0	1	0	0	0	124	0	4	0
Lane Group Flow (vph)	16	970	0	147	582	0	0	103	24	1	1	0
Confl. Peds. (#/hr)	28		23	24		29	23		24	29		28
Confl. Bikes (#/hr)			15			15			15			15
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.1	36.3		9.3	44.5			11.4	11.4	11.4	11.4	
Effective Green, g (s)	1.1	36.3		9.3	44.5			11.4	11.4	11.4	11.4	
Actuated g/C Ratio	0.02	0.53		0.13	0.64			0.17	0.17	0.17	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)	28	1790		238	2274			227	247	207	246	
v/s Ratio Prot	0.01	c0.29		c0.08	0.17						0.00	
v/s Ratio Perm								c0.07	0.02	0.00		
v/c Ratio	0.57	0.54		0.62	0.26			0.45	0.10	0.00	0.00	
Uniform Delay, d1	33.7	10.8		28.2	5.2			26.0	24.4	24.1	24.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	25.2	0.3		4.7	0.1			1.4	0.2	0.0	0.0	
Delay (s)	58.9	11.2		32.9	5.3			27.4	24.6	24.1	24.1	
Level of Service	E	B		C	A			C	C	C	C	
Approach Delay (s)		11.9			10.8			25.8			24.1	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	69.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
19: Santero Way & East Cotati Avenue #3/East Cotati Avenue

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	831	24	37	736	21	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	903	26	40	800	23	21
Pedestrians	5			5	5	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1160					
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			934		1407	475
vC1, stage 1 conf vol					921	
vC2, stage 2 conf vol					485	
vCu, unblocked vol			864		1352	388
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			95		93	96
cM capacity (veh/h)			746		318	585

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	602	327	40	400	400	43
Volume Left	0	0	40	0	0	23
Volume Right	0	26	0	0	0	21
cSH	1700	1700	746	1700	1700	406
Volume to Capacity	0.35	0.19	0.05	0.24	0.24	0.11
Queue Length 95th (ft)	0	0	4	0	0	9
Control Delay (s)	0.0	0.0	10.1	0.0	0.0	14.9
Lane LOS			B			B
Approach Delay (s)	0.0		0.5			14.9
Approach LOS						B

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	42.0%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
20: Madrone Avenue & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	753	7	43	775	1	7	1	51	14	0	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	793	7	45	816	1	7	1	54	15	0	9
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	817			800			1717	1718	796	1715	1722	816
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	817			800			1717	1718	796	1715	1722	816
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			89	99	86	74	100	97
cM capacity (veh/h)	811			823			66	84	387	58	84	377

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	7	800	45	817	62	24
Volume Left	7	0	45	0	7	15
Volume Right	0	7	0	1	54	9
cSH	811	1700	823	1700	236	86
Volume to Capacity	0.01	0.47	0.06	0.48	0.26	0.28
Queue Length 95th (ft)	1	0	4	0	26	26
Control Delay (s)	9.5	0.0	9.6	0.0	25.7	62.3
Lane LOS	A		A		D	F
Approach Delay (s)	0.1		0.5		25.7	62.3
Approach LOS					D	F

Intersection Summary				
Average Delay		2.1		
Intersection Capacity Utilization		52.1%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection Level of Service Calculations
Buildout to City Limits

HCM Signalized Intersection Capacity Analysis
1: New N-S Street & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	131	876	5	47	762	351	2	8	31	82	3	23
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	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3403		1770	3406	1583	1770	1863	1583	3433	1616	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3403		1770	3406	1583	1770	1863	1583	3433	1616	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	131	876	5	47	762	351	2	8	31	82	3	23
RTOR Reduction (vph)	0	0	0	0	0	130	0	0	29	0	21	0
Lane Group Flow (vph)	131	881	0	47	762	221	2	8	2	82	5	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases						6			8			
Actuated Green, G (s)	19.9	67.3		7.0	54.4	63.1	1.0	1.0	8.0	8.7	8.7	
Effective Green, g (s)	19.9	67.3		7.0	54.4	63.1	1.0	1.0	8.0	8.7	8.7	
Actuated g/C Ratio	0.20	0.67		0.07	0.54	0.63	0.01	0.01	0.08	0.09	0.09	
Clearance 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)	352	2290		123	1852	1062	17	18	126	298	140	
v/s Ratio Prot	0.07	c0.26		0.03	c0.22	0.02	0.00	c0.00	0.00	c0.02	0.00	
v/s Ratio Perm						0.12			0.00			
v/c Ratio	0.37	0.38		0.38	0.41	0.21	0.12	0.44	0.02	0.28	0.04	
Uniform Delay, d1	34.6	7.2		44.4	13.4	7.8	49.1	49.2	42.4	42.7	41.8	
Progression Factor	0.78	0.48		1.38	0.16	0.02	1.07	1.01	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.4		1.7	0.6	0.1	3.1	16.4	0.1	0.5	0.1	
Delay (s)	27.4	3.8		62.8	2.7	0.2	55.6	65.9	42.4	43.2	41.9	
Level of Service	C	A		E	A	A	E	E	D	D	D	
Approach Delay (s)		6.8			4.4			47.7			42.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: West Cotati Avenue & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	961	16	74	1151	180	23	8	80	42	3	9
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	0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	3399		1770	3354			1796	1583	1681	1696	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1770	3399		1770	3354			1796	1583	1681	1696	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	41	961	16	74	1151	180	23	8	80	42	3	9
RTOR Reduction (vph)	0	1	0	0	10	0	0	0	69	0	0	9
Lane Group Flow (vph)	41	976	0	74	1321	0	0	31	11	22	23	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		8	8	1	4	4	
Permitted Phases									8			4
Actuated Green, G (s)	4.2	66.0		9.6	71.4			3.9	13.5	4.5	4.5	4.5
Effective Green, g (s)	4.2	66.0		9.6	71.4			3.9	13.5	4.5	4.5	4.5
Actuated g/C Ratio	0.04	0.66		0.10	0.71			0.04	0.14	0.04	0.04	0.04
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)	74	2243		169	2394			70	213	75	76	71
v/s Ratio Prot	0.02	c0.29		0.04	c0.39			c0.02	0.00	0.01	c0.01	
v/s Ratio Perm									0.00			0.00
v/c Ratio	0.55	0.44		0.44	0.55			0.44	0.05	0.29	0.30	0.01
Uniform Delay, d1	47.0	8.1		42.7	6.7			47.0	37.7	46.2	46.2	45.6
Progression Factor	0.99	0.78		0.52	0.07			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.4	0.6		1.2	0.6			4.4	0.1	2.2	2.2	0.0
Delay (s)	55.0	6.9		23.4	1.1			51.4	37.8	48.4	48.5	45.6
Level of Service	E	A		C	A			D	D	D	D	D
Approach Delay (s)		8.8			2.2			41.6			48.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Redwood Drive & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	970	28	38	1261	629	28	24	38	486	35	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	12	12	12	12	16	16
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	0.91		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	0.96		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.91		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	
Satd. Flow (prot)	1711	4799		1770	3471	1567	1770	1625		1681	1823	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	
Satd. Flow (perm)	1711	4799		1770	3471	1567	1770	1625		1681	1823	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	107	970	28	38	1261	629	28	24	38	486	35	129
RTOR Reduction (vph)	0	3	0	0	0	88	0	37	0	0	25	0
Lane Group Flow (vph)	107	995	0	38	1261	541	28	25	0	330	295	0
Confl. Peds. (#/hr)			4			2			2			4
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	4%	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2		1	6	7	8	8		7	7	
Permitted Phases						6						
Actuated Green, G (s)	10.6	53.2		3.6	46.2	70.2	3.2	3.2		24.0	24.0	
Effective Green, g (s)	10.6	53.2		3.6	46.2	70.2	3.2	3.2		24.0	24.0	
Actuated g/C Ratio	0.11	0.53		0.04	0.46	0.70	0.03	0.03		0.24	0.24	
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)	181	2553		63	1603	1162	56	52		403	437	
v/s Ratio Prot	c0.06	0.21		0.02	c0.36	0.11	c0.02	0.02		c0.20	0.16	
v/s Ratio Perm						0.23						
v/c Ratio	0.59	0.39		0.60	0.79	0.47	0.50	0.48		0.82	0.67	
Uniform Delay, d1	42.6	13.8		47.5	22.7	6.6	47.6	47.6		35.9	34.5	
Progression Factor	0.72	0.38		1.11	0.64	0.41	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.8	0.4		8.0	2.1	0.2	6.9	7.0		12.2	4.1	
Delay (s)	35.6	5.7		60.6	16.6	2.9	54.5	54.6		48.2	38.6	
Level of Service	D	A		E	B	A	D	D		D	D	
Approach Delay (s)		8.6			13.0			54.5			43.4	
Approach LOS		A			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	75.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	857	649	230	1104	0	0	0	0	553	1	778
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3406	1436	1770	3406					3433	1502	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3406	1436	1770	3406					3433	1502	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	857	649	230	1104	0	0	0	0	553	1	778
RTOR Reduction (vph)	0	0	483	0	0	0	0	0	0	0	21	0
Lane Group Flow (vph)	0	857	166	230	1104	0	0	0	0	553	758	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			5									5
Heavy Vehicles (%)	2%	6%	6%	2%	6%	6%	6%	6%	6%	2%	2%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		25.6	25.6	15.4	45.0					47.0	47.0	
Effective Green, g (s)		25.6	25.6	15.4	45.0					47.0	47.0	
Actuated g/C Ratio		0.26	0.26	0.15	0.45					0.47	0.47	
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)		871	367	272	1532					1613	705	
v/s Ratio Prot		c0.25		c0.13	0.32					0.16	c0.50	
v/s Ratio Perm			0.12									
v/c Ratio		0.98	0.45	0.85	0.72					0.34	1.07	
Uniform Delay, d1		37.0	31.3	41.1	22.4					16.7	26.5	
Progression Factor		0.82	1.40	0.74	0.37					1.00	1.00	
Incremental Delay, d2		25.1	3.5	20.5	2.7					0.1	55.8	
Delay (s)		55.3	47.5	50.8	11.0					16.9	82.3	
Level of Service		E	D	D	B					B	F	
Approach Delay (s)		52.0			17.9			0.0			55.2	
Approach LOS		D			B			A			E	

Intersection Summary				
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	111.7%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1410	0	0	725	609	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.91	0.97	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3406			5085	3303	1548
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3406			5085	3303	1548
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1410	0	0	725	609	195
RTOR Reduction (vph)	0	0	0	0	0	38
Lane Group Flow (vph)	1410	0	0	725	609	157
Confl. Peds. (#/hr)						5
Confl. Bikes (#/hr)						5
Heavy Vehicles (%)	6%	2%	2%	2%	6%	2%
Turn Type	NA			NA	NA	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	65.8			65.8	26.2	26.2
Effective Green, g (s)	65.8			65.8	26.2	26.2
Actuated g/C Ratio	0.66			0.66	0.26	0.26
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)	2241			3345	865	405
v/s Ratio Prot	c0.41			0.14	c0.18	
v/s Ratio Perm						0.10
v/c Ratio	0.63			0.22	0.70	0.39
Uniform Delay, d1	10.0			6.8	33.4	30.3
Progression Factor	0.39			1.03	1.00	1.00
Incremental Delay, d2	0.9			0.1	2.6	0.6
Delay (s)	4.8			7.1	36.0	30.9
Level of Service	A			A	D	C
Approach Delay (s)	4.8			7.1	34.8	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	111.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Old Redwood Highway #1/NB US 101 On-ramp & Commerce Boulevard

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	283	159	737	516	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	11	12	12	12
Total Lost time (s)	4.0	4.0	4.5	4.0		
Lane Util. Factor	1.00	1.00	0.95	1.00		
Frt	1.00	0.85	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1888	1689	3355	1583		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1888	1689	3355	1583		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	283	159	737	516	0	0
RTOR Reduction (vph)	0	126	0	0	0	0
Lane Group Flow (vph)	283	33	737	516	0	0
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%
Turn Type	NA	Perm	NA	Free		
Protected Phases	7		6			
Permitted Phases		7		Free		
Actuated Green, G (s)	20.6	20.6	70.9	100.0		
Effective Green, g (s)	20.6	20.6	70.9	100.0		
Actuated g/C Ratio	0.21	0.21	0.71	1.00		
Clearance Time (s)	4.0	4.0	4.5			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	388	347	2378	1583		
v/s Ratio Prot	c0.15		0.22			
v/s Ratio Perm		0.02		c0.33		
v/c Ratio	0.73	0.09	0.31	0.33		
Uniform Delay, d1	37.1	32.1	5.4	0.0		
Progression Factor	1.00	1.00	0.59	1.00		
Incremental Delay, d2	6.7	0.1	0.3	0.4		
Delay (s)	43.8	32.3	3.5	0.4		
Level of Service	D	C	A	A		
Approach Delay (s)	39.7		2.2			0.0
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Old Redwood Highway #1 & Gravenstein Hwy #5/Gravenstein Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	638	39	915	30	55	28	502	621	9	3	130	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	14	12
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.94		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	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	0.95		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	1863	1548	1770	1670		3433	1857		1770	1987	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	1863	1548	1770	1670		3433	1857		1770	1987	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	638	39	915	30	55	28	502	621	9	3	130	182
RTOR Reduction (vph)	0	0	0	0	19	0	0	1	0	0	0	0
Lane Group Flow (vph)	638	39	915	30	64	0	502	629	0	3	130	182
Confl. Peds. (#/hr)			20			20			20			20
Confl. Bikes (#/hr)			20			20			20			20
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Free	Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	5	2		1	6		3	8		7	4	4 5
Permitted Phases			Free									
Actuated Green, G (s)	37.0	39.1	100.0	4.2	6.3		18.9	39.9		0.8	21.8	62.8
Effective Green, g (s)	37.0	39.1	100.0	4.2	6.3		18.9	39.9		0.8	21.8	62.8
Actuated g/C Ratio	0.37	0.39	1.00	0.04	0.06		0.19	0.40		0.01	0.22	0.63
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)	1245	728	1548	74	105		648	740		14	433	994
v/s Ratio Prot	0.19	0.02		0.02	0.04		0.15	c0.34		0.00	0.07	0.11
v/s Ratio Perm			c0.59									
v/c Ratio	0.51	0.05	0.59	0.41	0.61		0.77	0.85		0.21	0.30	0.18
Uniform Delay, d1	24.5	18.9	0.0	46.7	45.7		38.5	27.3		49.3	32.7	7.8
Progression Factor	1.24	1.05	1.00	1.00	1.00		1.00	1.00		1.50	0.16	0.47
Incremental Delay, d2	1.2	0.0	1.3	3.6	10.1		5.8	9.2		7.2	0.4	0.1
Delay (s)	31.5	20.0	1.3	50.3	55.8		44.3	36.6		81.4	5.7	3.8
Level of Service	C	C	A	D	E		D	D		F	A	A
Approach Delay (s)		13.9			54.3			40.0			5.3	
Approach LOS		B			D			D			A	

Intersection Summary				
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	71.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
8: Old Redwood Highway #1 & William Street/George Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	1	14	18	2	31	13	965	4	14	1004	45
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.95		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.96			0.99		0.98	1.00		0.97	1.00	
Frt		0.98			0.92		1.00	1.00		1.00	0.99	
Flt Protected		0.96			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1495			1411		1555	3182		1551	3147	
Flt Permitted		0.73			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1133			1262		1555	3182		1551	3147	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	71	1	14	18	2	31	13	965	4	14	1004	45
RTOR Reduction (vph)	0	11	0	0	26	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	75	0	0	25	0	13	969	0	14	1046	0
Confl. Peds. (#/hr)	60		60	60		60	60		60	60		60
Confl. Bikes (#/hr)			20			20			20			20
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		8.4			8.4		0.6	35.5		0.6	35.5	
Effective Green, g (s)		8.4			8.4		0.6	35.5		0.6	35.5	
Actuated g/C Ratio		0.15			0.15		0.01	0.63		0.01	0.63	
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)		168			187		16	1999		16	1977	
v/s Ratio Prot							0.01	0.30		c0.01	c0.33	
v/s Ratio Perm		c0.07			0.02							
v/c Ratio		0.45			0.13		0.81	0.48		0.88	0.53	
Uniform Delay, d1		21.9			20.9		27.9	5.6		27.9	5.8	
Progression Factor		1.04			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9			0.3		132.2	0.2		161.3	0.3	
Delay (s)		24.8			21.2		160.1	5.8		189.2	6.1	
Level of Service		C			C		F	A		F	A	
Approach Delay (s)		24.8			21.2			7.8			8.5	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	56.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	56.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Old Redwood Highway #2/Old Redwood Highway #1 & West Sierra Avenue #4/East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	260	4	0	356	485	9	353	17	592	300	122
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	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.83		1.00	0.95	1.00	1.00		1.00	0.98	
Flpb, ped/bikes	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	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1314		1863	1510	1770	3501		3433	1742	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1314		1863	1510	1770	3501		3433	1742	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	147	260	4	0	356	485	9	353	17	592	300	122
RTOR Reduction (vph)	0	0	3	0	0	90	0	3	0	0	15	0
Lane Group Flow (vph)	147	260	1	0	356	395	9	367	0	592	407	0
Confl. Peds. (#/hr)			50			50			50			50
Confl. Bikes (#/hr)			20			20			20			20
Turn Type	Prot	NA	Perm		NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	5	2			6	7	3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	9.0	31.6	31.6		18.6	37.0	0.8	29.2		18.4	46.8	
Effective Green, g (s)	9.0	31.6	31.6		18.6	37.0	0.8	29.2		18.4	46.8	
Actuated g/C Ratio	0.10	0.35	0.35		0.20	0.41	0.01	0.32		0.20	0.51	
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)	174	645	455		379	678	15	1120		692	893	
v/s Ratio Prot	c0.08	0.14			c0.19	c0.12	0.01	0.10		c0.17	c0.23	
v/s Ratio Perm			0.00			0.14						
v/c Ratio	0.84	0.40	0.00		0.94	0.58	0.60	0.33		0.86	0.46	
Uniform Delay, d1	40.4	22.6	19.5		35.7	21.1	45.0	23.5		35.1	14.1	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	29.5	0.4	0.0		30.7	1.3	51.0	0.2		10.1	0.4	
Delay (s)	69.9	23.1	19.5		66.5	22.4	96.1	23.7		45.2	14.5	
Level of Service	E	C	B		E	C	F	C		D	B	
Approach Delay (s)		39.8			41.0			25.4			32.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	91.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 AWSC
10: Old Redwood Highway #2 & Henry Street/Charles Street

Intersection	
Intersection Delay, s/veh	14.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	25	17	39	170	14	15	11	369	76	9	285	9
Peak Hour 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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	17	39	170	14	15	11	369	76	9	285	9
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	10.3	12.5	16.1	13.6
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	0%	31%	85%	3%
Vol Thru, %	97%	0%	21%	7%	94%
Vol Right, %	0%	100%	48%	8%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	380	76	81	199	303
LT Vol	369	0	17	14	285
Through Vol	0	76	39	15	9
RT Vol	11	0	25	170	9
Lane Flow Rate	380	76	81	199	303
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.617	0.108	0.139	0.344	0.472
Departure Headway (Hd)	5.845	5.121	6.176	6.216	5.603
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	616	698	577	577	642
Service Time	3.594	2.869	4.254	4.278	3.657
HCM Lane V/C Ratio	0.617	0.109	0.14	0.345	0.472
HCM Control Delay	17.6	8.5	10.3	12.5	13.6
HCM Lane LOS	C	A	B	B	B
HCM 95th-tile Q	4.2	0.4	0.5	1.5	2.5

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
11: Old Redwood Highway/Old Redwood Highway #2 & Valparaiso Avenue/Myrtle Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	44	63	167	62	45	37	408	108	49	403	3
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
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1669		1770	1716		1770	1863	1539	1770	1863	1531
Flt Permitted	0.69	1.00		0.69	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1281	1669		1281	1716		1770	1863	1539	1770	1863	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	44	63	167	62	45	37	408	108	49	403	3
RTOR Reduction (vph)	0	46	0	0	25	0	0	0	62	0	0	2
Lane Group Flow (vph)	6	61	0	167	82	0	37	408	46	49	403	1
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	13.9	13.9		13.9	13.9		2.5	21.7	21.7	3.6	22.8	22.8
Effective Green, g (s)	13.9	13.9		13.9	13.9		2.5	21.7	21.7	3.6	22.8	22.8
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.05	0.42	0.42	0.07	0.45	0.45
Clearance 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)	347	453		347	465		86	789	652	124	829	681
v/s Ratio Prot		0.04			0.05		0.02	c0.22		c0.03	0.22	
v/s Ratio Perm	0.00			c0.13					0.03			0.00
v/c Ratio	0.02	0.13		0.48	0.18		0.43	0.52	0.07	0.40	0.49	0.00
Uniform Delay, d1	13.7	14.1		15.6	14.3		23.7	10.9	8.8	22.8	10.1	7.9
Progression Factor	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	0.1		1.1	0.2		3.4	0.6	0.0	2.1	0.5	0.0
Delay (s)	13.7	14.2		16.7	14.4		27.1	11.5	8.8	24.8	10.5	7.9
Level of Service	B	B		B	B		C	B	A	C	B	A
Approach Delay (s)		14.2			15.8			12.0			12.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	51.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 AWSC
12: SB US 101 On-ramp/West School Road & West Sierra Avenue #4

Intersection	
Intersection Delay, s/veh	22.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	2	169	26	371	288	38	0	0	0	37	21	5
Peak Hour 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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	169	26	371	288	38	0	0	0	37	21	5
Number of Lanes	0	1	0	0	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	9.5	27.4	9.7
HCM LOS	A	D	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	53%	59%
Vol Thru, %	86%	41%	33%
Vol Right, %	13%	5%	8%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	197	697	63
LT Vol	169	288	21
Through Vol	26	38	5
RT Vol	2	371	37
Lane Flow Rate	197	697	63
Geometry Grp	1	1	1
Degree of Util (X)	0.261	0.854	0.104
Departure Headway (Hd)	4.767	4.412	5.96
Convergence, Y/N	Yes	Yes	Yes
Cap	751	822	598
Service Time	2.81	2.442	4.031
HCM Lane V/C Ratio	0.262	0.848	0.105
HCM Control Delay	9.5	27.4	9.7
HCM Lane LOS	A	D	A
HCM 95th-tile Q	1	10.3	0.3

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Unsignalized Intersection Capacity Analysis
13: NB US 101 Off-ramp & West Sierra Avenue #4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	206	0	0	665	33	430
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	206	0	0	665	33	430
Pedestrians	1			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			206		872	207
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			206		872	207
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	48
cM capacity (veh/h)			1365		321	833

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	206	665	33	430
Volume Left	0	0	33	0
Volume Right	0	0	0	430
cSH	1700	1700	321	833
Volume to Capacity	0.12	0.39	0.10	0.52
Queue Length 95th (ft)	0	0	9	76
Control Delay (s)	0.0	0.0	17.5	13.8
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	14.1	
Approach LOS			B	

Intersection Summary			
Average Delay		4.9	
Intersection Capacity Utilization		45.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM 2010 AWSC
14: West Sierra Avenue #4 & East School Street

Intersection	
Intersection Delay, s/veh	16.2
Intersection LOS	C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	16	527	460	21	30	29
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	527	460	21	30	29
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	17.7	15.2	9.7
HCM LOS	C	C	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	0%	51%
Vol Thru, %	97%	96%	0%
Vol Right, %	0%	4%	49%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	543	481	59
LT Vol	527	460	0
Through Vol	0	21	29
RT Vol	16	0	30
Lane Flow Rate	543	481	59
Geometry Grp	1	1	1
Degree of Util (X)	0.698	0.623	0.097
Departure Headway (Hd)	4.628	4.66	5.922
Convergence, Y/N	Yes	Yes	Yes
Cap	776	770	599
Service Time	2.676	2.709	4.02
HCM Lane V/C Ratio	0.7	0.625	0.098
HCM Control Delay	17.7	15.2	9.7
HCM Lane LOS	C	C	A
HCM 95th-tile Q	5.8	4.4	0.3

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
15: Charles Street & East Cotati Avenue #3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	971	3	205	936	1	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		3.0	4.0	3.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	0.94	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1675		1770	1863	1518	
Flt Permitted	1.00		0.16	1.00	1.00	
Satd. Flow (perm)	1675		297	1863	1518	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	971	3	205	936	1	101
RTOR Reduction (vph)	0	0	0	0	89	0
Lane Group Flow (vph)	974	0	205	936	13	0
Confl. Peds. (#/hr)		30	10		11	10
Confl. Bikes (#/hr)		5				5
Parking (#/hr)	0					
Turn Type	NA		pm+pt	NA	NA	
Protected Phases	4		3	8	2	
Permitted Phases			8			
Actuated Green, G (s)	60.9		70.8	70.8	10.1	
Effective Green, g (s)	60.9		70.8	70.8	10.1	
Actuated g/C Ratio	0.69		0.81	0.81	0.11	
Clearance Time (s)	4.0		3.0	4.0	3.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1160		354	1500	174	
v/s Ratio Prot	c0.58		0.05	c0.50	c0.01	
v/s Ratio Perm			0.42			
v/c Ratio	0.84		0.58	0.62	0.07	
Uniform Delay, d1	9.9		10.3	3.3	34.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	5.5		2.3	0.8	0.2	
Delay (s)	15.4		12.6	4.2	34.9	
Level of Service	B		B	A	C	
Approach Delay (s)	15.4			5.7	34.9	
Approach LOS	B			A	C	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	87.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Lasalle Avenue & East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	895	125	56	996	6	183	1	46	0	1	5
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	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00			0.98			0.92	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.97			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.96			1.00	
Satd. Flow (prot)	1770	3402		1770	3532			1711			1526	
Flt Permitted	0.95	1.00		0.95	1.00			0.77			1.00	
Satd. Flow (perm)	1770	3402		1770	3532			1363			1526	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	11	895	125	56	996	6	183	1	46	0	1	5
RTOR Reduction (vph)	0	10	0	0	0	0	0	12	0	0	4	0
Lane Group Flow (vph)	11	1010	0	56	1002	0	0	218	0	0	2	0
Confl. Peds. (#/hr)			60			60			60			60
Confl. Bikes (#/hr)			30			30			30			30
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	0.6	34.5		3.6	37.5			16.5			16.5	
Effective Green, g (s)	0.6	34.5		3.6	37.5			16.5			16.5	
Actuated g/C Ratio	0.01	0.52		0.05	0.56			0.25			0.25	
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)	15	1762		95	1988			337			378	
v/s Ratio Prot	0.01	c0.30		c0.03	c0.28						0.00	
v/s Ratio Perm								c0.16				
v/c Ratio	0.73	0.57		0.59	0.50			0.65			0.01	
Uniform Delay, d1	32.9	11.0		30.8	8.9			22.4			18.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	103.2	0.5		9.0	0.2			4.2			0.0	
Delay (s)	136.2	11.5		39.8	9.1			26.7			18.9	
Level of Service	F	B		D	A			C			B	
Approach Delay (s)		12.8			10.7			26.7			18.9	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: East Cotati Avenue #3 & Adrian Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	679	35	35	888	134	40	5	55	121	5	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	10
Total Lost time (s)	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
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.98			0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (prot)	1770	3513		1770	3443			1691			1777	1404
Flt Permitted	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (perm)	1770	3513		1770	3443			1691			1777	1404
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	105	679	35	35	888	134	40	5	55	121	5	206
RTOR Reduction (vph)	0	3	0	0	9	0	0	50	0	0	0	139
Lane Group Flow (vph)	105	711	0	35	1013	0	0	50	0	0	126	67
Confl. Peds. (#/hr)	17					11				11		17
Confl. Bikes (#/hr)						10						10
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												4
Actuated Green, G (s)	8.4	49.9		6.2	47.7			9.0			12.9	12.9
Effective Green, g (s)	8.4	49.9		6.2	47.7			9.0			12.9	12.9
Actuated g/C Ratio	0.09	0.53		0.07	0.51			0.10			0.14	0.14
Clearance Time (s)	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
Lane Grp Cap (vph)	158	1864		116	1747			161			243	192
v/s Ratio Prot	c0.06	0.20		0.02	c0.29			c0.03			c0.07	
v/s Ratio Perm												0.05
v/c Ratio	0.66	0.38		0.30	0.58			0.31			0.52	0.35
Uniform Delay, d1	41.4	13.0		41.8	16.2			39.6			37.7	36.7
Progression Factor	1.00	1.00		0.81	0.67			1.00			1.00	1.00
Incremental Delay, d2	10.1	0.6		1.4	1.3			1.1			1.9	1.1
Delay (s)	51.5	13.6		35.4	12.2			40.7			39.5	37.9
Level of Service	D	B		D	B			D			D	D
Approach Delay (s)		18.4			12.9			40.7			38.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
18: Lancaster Drive & East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	717	123	125	927	3	172	1	231	9	1	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.94	1.00	0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97	1.00	0.97	1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3415		1770	3536			1721	1488	1663	1504	
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00	0.50	1.00	
Satd. Flow (perm)	1770	3415		1770	3536			1295	1488	871	1504	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	9	717	123	125	927	3	172	1	231	9	1	14
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	188	0	11	0
Lane Group Flow (vph)	9	827	0	125	930	0	0	173	43	9	4	0
Confl. Peds. (#/hr)	28		23	24		29	23		24	29		28
Confl. Bikes (#/hr)			15			15			15			15
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	3.2	49.5		14.8	61.1			17.7	17.7	17.7	17.7	
Effective Green, g (s)	3.2	49.5		14.8	61.1			17.7	17.7	17.7	17.7	
Actuated g/C Ratio	0.03	0.53		0.16	0.65			0.19	0.19	0.19	0.19	
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)	60	1798		278	2298			243	280	164	283	
v/s Ratio Prot	0.01	c0.24		c0.07	c0.26						0.00	
v/s Ratio Perm								c0.13	0.03	0.01		
v/c Ratio	0.15	0.46		0.45	0.40			0.71	0.16	0.05	0.01	
Uniform Delay, d1	44.1	13.9		35.9	7.8			35.8	31.9	31.3	31.0	
Progression Factor	0.79	0.43		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	0.8		1.2	0.5			9.5	0.3	0.1	0.0	
Delay (s)	35.8	6.8		37.1	8.3			45.2	32.2	31.4	31.1	
Level of Service	D	A		D	A			D	C	C	C	
Approach Delay (s)		7.1			11.7			37.7			31.2	
Approach LOS		A			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
19: Santero Way & East Cotati Avenue #3/East Cotati Avenue

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	606	215	35	975	93	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3366		1770	3539	1770	1525
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3366		1770	3539	1770	1525
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	606	215	35	975	93	21
RTOR Reduction (vph)	33	0	0	0	0	18
Lane Group Flow (vph)	788	0	35	975	93	3
Confl. Peds. (#/hr)		5	5		5	5
Confl. Bikes (#/hr)		15				15
Turn Type	NA		Prot	NA	NA	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	26.9		2.5	33.4	7.6	7.6
Effective Green, g (s)	26.9		2.5	33.4	7.6	7.6
Actuated g/C Ratio	0.55		0.05	0.68	0.16	0.16
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1847		90	2412	274	236
v/s Ratio Prot	0.23		0.02	c0.28	c0.05	
v/s Ratio Perm						0.00
v/c Ratio	0.43		0.39	0.40	0.34	0.01
Uniform Delay, d1	6.5		22.5	3.4	18.5	17.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		2.8	0.1	0.7	0.0
Delay (s)	6.7		25.3	3.5	19.2	17.6
Level of Service	A		C	A	B	B
Approach Delay (s)	6.7			4.3	18.9	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
20: Madrone Avenue & Gravenstein Highway/Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	866	15	34	545	188	15	29	30	105	14	24
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
Lane Util. Factor	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		1.00	1.00	0.85	1.00	0.92		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)	1770	1789		1770	1792	1583	1770	1721		1770	1863	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)	1770	1789		1770	1792	1583	1770	1721		1770	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	866	15	34	545	188	15	29	30	105	14	24
RTOR Reduction (vph)	0	1	0	0	0	48	0	29	0	0	0	19
Lane Group Flow (vph)	48	880	0	34	545	140	15	30	0	105	14	5
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases						6						4
Actuated Green, G (s)	5.6	65.8		2.5	62.7	74.4	0.8	4.0		11.7	14.9	20.5
Effective Green, g (s)	5.6	65.8		2.5	62.7	74.4	0.8	4.0		11.7	14.9	20.5
Actuated g/C Ratio	0.06	0.66		0.02	0.63	0.74	0.01	0.04		0.12	0.15	0.20
Clearance 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)	99	1177		44	1123	1177	14	68		207	277	387
v/s Ratio Prot	0.03	c0.49		0.02	c0.30	0.01	0.01	c0.02		c0.06	c0.01	0.00
v/s Ratio Perm						0.07						0.00
v/c Ratio	0.48	0.75		0.77	0.49	0.12	1.07	0.44		0.51	0.05	0.01
Uniform Delay, d1	45.8	11.5		48.5	10.0	3.6	49.6	46.9		41.4	36.5	31.7
Progression Factor	1.00	1.00		0.59	0.05	0.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	2.6		54.6	1.4	0.0	265.6	4.6		2.0	0.1	0.0
Delay (s)	49.5	14.2		83.2	1.9	0.1	315.2	51.5		43.4	36.6	31.7
Level of Service	D	B		F	A	A	F	D		D	D	C
Approach Delay (s)		16.0			5.1			104.9			40.8	
Approach LOS		B			A			F			D	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: New N-S Street & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	1040	37	95	1219	238	39	5	115	461	9	210
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	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3393		1770	3406	1583	1770	1863	1583	3433	1595	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3393		1770	3406	1583	1770	1863	1583	3433	1595	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	1040	37	95	1219	238	39	5	115	461	9	210
RTOR Reduction (vph)	0	2	0	0	0	69	0	0	103	0	177	0
Lane Group Flow (vph)	111	1075	0	95	1219	169	39	5	12	461	42	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases						6			8			
Actuated Green, G (s)	12.0	54.8		9.9	52.7	71.2	3.6	0.8	10.7	18.5	15.7	
Effective Green, g (s)	12.0	54.8		9.9	52.7	71.2	3.6	0.8	10.7	18.5	15.7	
Actuated g/C Ratio	0.12	0.55		0.10	0.53	0.71	0.04	0.01	0.11	0.18	0.16	
Clearance 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)	212	1859		175	1794	1127	63	14	232	635	250	
v/s Ratio Prot	0.06	c0.32		0.05	c0.36	0.03	0.02	0.00	0.01	c0.13	c0.03	
v/s Ratio Perm						0.08			0.00			
v/c Ratio	0.52	0.58		0.54	0.68	0.15	0.62	0.36	0.05	0.73	0.17	
Uniform Delay, d1	41.3	15.0		42.9	17.4	4.6	47.5	49.3	40.1	38.4	36.5	
Progression Factor	0.55	0.23		1.22	0.24	0.72	1.01	1.07	1.56	1.00	1.00	
Incremental Delay, d2	1.9	1.1		2.5	1.5	0.0	16.7	14.9	0.1	4.1	0.3	
Delay (s)	24.4	4.5		55.0	5.7	3.4	64.8	67.6	62.8	42.5	36.8	
Level of Service	C	A		D	A	A	E	E	E	D	D	
Approach Delay (s)		6.4			8.4			63.4			40.7	
Approach LOS		A			A			E			D	

Intersection Summary				
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: West Cotati Avenue & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	1501	36	142	1404	167	28	6	127	281	10	110
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	0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	3397		1770	3365			1789	1583	1681	1691	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1770	3397		1770	3365			1789	1583	1681	1691	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	1501	36	142	1404	167	28	6	127	281	10	110
RTOR Reduction (vph)	0	2	0	0	9	0	0	0	84	0	0	79
Lane Group Flow (vph)	83	1535	0	142	1562	0	0	34	43	146	145	31
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8	1	4	4	5
Permitted Phases									8			4
Actuated Green, G (s)	7.3	57.5		12.1	62.3			2.4	14.5	12.0	12.0	19.3
Effective Green, g (s)	7.3	57.5		12.1	62.3			2.4	14.5	12.0	12.0	19.3
Actuated g/C Ratio	0.07	0.58		0.12	0.62			0.02	0.14	0.12	0.12	0.19
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)	129	1953		214	2096			42	229	201	202	305
v/s Ratio Prot	0.05	c0.45		0.08	c0.46			c0.02	0.02	c0.09	0.09	0.01
v/s Ratio Perm									0.00			0.01
v/c Ratio	0.64	0.79		0.66	0.75			0.81	0.19	0.73	0.72	0.10
Uniform Delay, d1	45.1	16.5		42.0	13.3			48.6	37.6	42.4	42.4	33.2
Progression Factor	1.11	0.57		0.50	0.26			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.8	2.7		2.4	0.8			68.7	0.4	12.3	11.5	0.1
Delay (s)	58.8	12.1		23.6	4.2			117.3	38.0	54.7	53.9	33.4
Level of Service	E	B		C	A			F	D	D	D	C
Approach Delay (s)		14.5			5.8			54.7			48.5	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	75.2%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Redwood Drive & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	166	1734	36	38	1368	278	39	7	48	702	14	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	12	12	12	12	16	16
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	0.91		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	0.94		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.87		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	
Satd. Flow (prot)	1711	4805		1770	3471	1570	1770	1528		1681	1757	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	
Satd. Flow (perm)	1711	4805		1770	3471	1570	1770	1528		1681	1757	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	166	1734	36	38	1368	278	39	7	48	702	14	326
RTOR Reduction (vph)	0	2	0	0	0	86	0	46	0	0	65	0
Lane Group Flow (vph)	166	1768	0	38	1368	192	39	9	0	541	436	0
Confl. Peds. (#/hr)			4			2			2			4
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	4%	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2		1	6	7	8	8		7	7	
Permitted Phases						6						
Actuated Green, G (s)	11.6	45.8		2.4	36.6	69.2	3.2	3.2		32.6	32.6	
Effective Green, g (s)	11.6	45.8		2.4	36.6	69.2	3.2	3.2		32.6	32.6	
Actuated g/C Ratio	0.12	0.46		0.02	0.37	0.69	0.03	0.03		0.33	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)	198	2200		42	1270	1149	56	48		548	572	
v/s Ratio Prot	0.10	c0.37		0.02	c0.39	0.05	c0.02	0.01		c0.32	0.25	
v/s Ratio Perm						0.07						
v/c Ratio	0.84	0.80		0.90	1.08	0.17	0.70	0.18		0.99	0.76	
Uniform Delay, d1	43.3	23.2		48.7	31.7	5.4	47.9	47.1		33.5	30.2	
Progression Factor	0.81	0.65		1.23	0.60	0.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.7	2.2		83.1	45.5	0.0	31.4	1.8		34.8	5.9	
Delay (s)	53.9	17.3		143.1	64.5	0.1	79.3	48.9		68.3	36.2	
Level of Service	D	B		F	E	A	E	D		E	D	
Approach Delay (s)		20.4			55.6			61.5			52.9	
Approach LOS		C			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1603	886	146	1227	0	0	0	0	580	1	479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3406	1439	1770	3406					3433	1499	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3406	1439	1770	3406					3433	1499	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1603	886	146	1227	0	0	0	0	580	1	479
RTOR Reduction (vph)	0	0	392	0	0	0	0	0	0	0	72	0
Lane Group Flow (vph)	0	1603	494	146	1227	0	0	0	0	580	408	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			5									5
Heavy Vehicles (%)	2%	6%	6%	2%	6%	6%	6%	6%	6%	2%	2%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		50.0	50.0	13.0	67.0					25.0	25.0	
Effective Green, g (s)		50.0	50.0	13.0	67.0					25.0	25.0	
Actuated g/C Ratio		0.50	0.50	0.13	0.67					0.25	0.25	
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)		1703	719	230	2282					858	374	
v/s Ratio Prot		c0.47		c0.08	0.36					0.17	c0.27	
v/s Ratio Perm			0.34									
v/c Ratio		0.94	0.69	0.63	0.54					0.68	1.09	
Uniform Delay, d1		23.6	19.0	41.2	8.5					33.8	37.5	
Progression Factor		0.66	1.08	1.77	0.58					1.00	1.00	
Incremental Delay, d2		7.4	3.0	5.5	0.9					2.1	73.2	
Delay (s)		23.0	23.6	78.3	5.8					36.0	110.7	
Level of Service		C	C	E	A					D	F	
Approach Delay (s)		23.2			13.5			0.0			69.8	
Approach LOS		C			B			A			E	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	103.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2183	0	0	897	476	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.91	0.97	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3406			5085	3303	1548
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3406			5085	3303	1548
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2183	0	0	897	476	365
RTOR Reduction (vph)	0	0	0	0	0	10
Lane Group Flow (vph)	2183	0	0	897	476	355
Confl. Peds. (#/hr)						5
Confl. Bikes (#/hr)						5
Heavy Vehicles (%)	6%	2%	2%	2%	6%	2%
Turn Type	NA			NA	NA	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	68.0			68.0	24.0	24.0
Effective Green, g (s)	68.0			68.0	24.0	24.0
Actuated g/C Ratio	0.68			0.68	0.24	0.24
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)	2316			3457	792	371
v/s Ratio Prot	c0.64			0.18	0.14	
v/s Ratio Perm						c0.23
v/c Ratio	0.94			0.26	0.60	0.96
Uniform Delay, d1	14.3			6.2	33.7	37.5
Progression Factor	0.62			0.44	1.00	1.00
Incremental Delay, d2	5.0			0.1	1.3	35.3
Delay (s)	13.8			2.9	35.0	72.8
Level of Service	B			A	D	E
Approach Delay (s)	13.8			2.9	51.4	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	103.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Old Redwood Highway #1/NB US 101 On-ramp & Commerce Boulevard

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	514	49	1180	810	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	11	12	12	12
Total Lost time (s)	4.0	4.0	4.5	4.0		
Lane Util. Factor	1.00	1.00	0.95	1.00		
Frt	1.00	0.85	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1888	1689	3355	1583		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1888	1689	3355	1583		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	514	49	1180	810	0	0
RTOR Reduction (vph)	0	32	0	0	0	0
Lane Group Flow (vph)	514	17	1180	810	0	0
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%
Turn Type	NA	Perm	NA	Free		
Protected Phases	7		6			
Permitted Phases		7		Free		
Actuated Green, G (s)	32.8	32.8	58.7	100.0		
Effective Green, g (s)	32.8	32.8	58.7	100.0		
Actuated g/C Ratio	0.33	0.33	0.59	1.00		
Clearance Time (s)	4.0	4.0	4.5			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	619	553	1969	1583		
v/s Ratio Prot	c0.27		c0.35			
v/s Ratio Perm		0.01		0.51		
v/c Ratio	0.83	0.03	0.60	0.51		
Uniform Delay, d1	31.0	22.8	13.2	0.0		
Progression Factor	1.00	1.00	0.65	1.00		
Incremental Delay, d2	9.2	0.0	0.1	0.1		
Delay (s)	40.3	22.8	8.7	0.1		
Level of Service	D	C	A	A		
Approach Delay (s)	38.8		5.2			0.0
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Old Redwood Highway #1 & Gravenstein Hwy #5/Gravenstein Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1175	109	1265	38	63	52	561	800	43	21	228	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	14	12
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.93		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	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	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	1863	1548	1770	1612		3433	1841		1770	1987	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	1863	1548	1770	1612		3433	1841		1770	1987	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1175	109	1265	38	63	52	561	800	43	21	228	271
RTOR Reduction (vph)	0	0	0	0	29	0	0	2	0	0	0	0
Lane Group Flow (vph)	1175	109	1265	38	86	0	561	841	0	21	228	271
Confl. Peds. (#/hr)			20			20			20			20
Confl. Bikes (#/hr)			20			20			20			20
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Free	Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	5	2		1	6		3	8		7	4	4 5
Permitted Phases			Free									
Actuated Green, G (s)	30.0	33.0	100.0	3.6	6.6		20.6	45.8		1.6	26.8	60.8
Effective Green, g (s)	30.0	33.0	100.0	3.6	6.6		20.6	45.8		1.6	26.8	60.8
Actuated g/C Ratio	0.30	0.33	1.00	0.04	0.07		0.21	0.46		0.02	0.27	0.61
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)	1010	614	1548	63	106		707	843		28	532	962
v/s Ratio Prot	c0.35	0.06		0.02	0.05		0.16	c0.46		0.01	0.11	0.17
v/s Ratio Perm			c0.82									
v/c Ratio	1.16	0.18	0.82	0.60	0.81		0.79	1.00		0.75	0.43	0.28
Uniform Delay, d1	35.0	23.8	0.0	47.5	46.1		37.7	27.1		49.0	30.3	9.3
Progression Factor	0.76	0.80	1.00	1.00	1.00		1.00	1.00		1.42	0.43	0.83
Incremental Delay, d2	77.5	0.0	1.7	15.2	35.8		6.1	30.3		58.1	0.4	0.1
Delay (s)	104.1	19.2	1.7	62.7	81.9		43.8	57.3		127.8	13.3	7.8
Level of Service	F	B	A	E	F		D	E		F	B	A
Approach Delay (s)		49.7			77.1			51.9			15.0	
Approach LOS		D			E			D			B	

Intersection Summary				
HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.12			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	98.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
8: Old Redwood Highway #1 & William Street/George Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	2	28	11	1	41	15	1181	11	42	1300	69
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.93		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.96			0.99		0.98	1.00		1.00	1.00	
Frt		0.97			0.90		1.00	1.00		1.00	0.99	
Flt Protected		0.96			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1469			1364		1565	3176		1593	3137	
Flt Permitted		0.78			0.94		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1183			1298		1565	3176		1593	3137	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	2	28	11	1	41	15	1181	11	42	1300	69
RTOR Reduction (vph)	0	18	0	0	35	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	101	0	0	18	0	15	1191	0	42	1366	0
Confl. Peds. (#/hr)	60		60	60		60	60		60	60		60
Confl. Bikes (#/hr)			20			20			20			20
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		9.7			9.7		0.7	42.1		2.7	44.1	
Effective Green, g (s)		9.7			9.7		0.7	42.1		2.7	44.1	
Actuated g/C Ratio		0.15			0.15		0.01	0.63		0.04	0.66	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		172			189		16	2010		64	2080	
v/s Ratio Prot							0.01	0.38		c0.03	c0.44	
v/s Ratio Perm		c0.09			0.01							
v/c Ratio		0.59			0.10		0.94	0.59		0.66	0.66	
Uniform Delay, d1		26.5			24.6		32.9	7.2		31.4	6.7	
Progression Factor		1.03			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.0			0.2		191.7	0.5		21.7	0.8	
Delay (s)		32.4			24.8		224.6	7.6		53.1	7.4	
Level of Service		C			C		F	A		D	A	
Approach Delay (s)		32.4			24.8			10.3			8.8	
Approach LOS		C			C			B			A	

Intersection Summary				
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Old Redwood Highway #2/Old Redwood Highway #1 & West Sierra Avenue #4/East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	167	370	6	0	316	612	5	442	11	653	439	147
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	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.66		1.00	0.92	1.00	1.00		1.00	0.96	
Flpb, ped/bikes	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	0.85	1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1045		1863	1457	1770	3513		3433	1723	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1045		1863	1457	1770	3513		3433	1723	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	370	6	0	316	612	5	442	11	653	439	147
RTOR Reduction (vph)	0	0	4	0	0	47	0	1	0	0	10	0
Lane Group Flow (vph)	167	370	2	0	316	565	5	452	0	653	576	0
Confl. Peds. (#/hr)			100			100			100			100
Confl. Bikes (#/hr)			20			20			20			20
Turn Type	Prot	NA	Perm		NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	5	2			6	7	3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	12.9	37.6	37.6		20.7	47.6	0.7	29.5		26.9	55.7	
Effective Green, g (s)	12.9	37.6	37.6		20.7	47.6	0.7	29.5		26.9	55.7	
Actuated g/C Ratio	0.12	0.35	0.35		0.20	0.45	0.01	0.28		0.25	0.53	
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)	215	660	370		363	709	11	977		871	905	
v/s Ratio Prot	c0.09	0.20			c0.17	c0.20	0.00	0.13		0.19	c0.33	
v/s Ratio Perm			0.00			0.19						
v/c Ratio	0.78	0.56	0.01		0.87	0.80	0.45	0.46		0.75	0.64	
Uniform Delay, d1	45.2	27.5	22.1		41.4	25.0	52.5	31.7		36.4	17.9	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.0	1.1	0.0		19.7	6.2	27.0	0.3		3.6	1.5	
Delay (s)	61.2	28.6	22.1		61.1	31.2	79.5	32.0		40.0	19.4	
Level of Service	E	C	C		E	C	E	C		D	B	
Approach Delay (s)		38.6			41.4			32.5			30.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 AWSC
10: Old Redwood Highway #2 & Henry Street/Charles Street

Intersection	
Intersection Delay, s/veh	17.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	18	24	27	120	16	32	17	406	192	34	387	17
Peak Hour 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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	24	27	120	16	32	17	406	192	34	387	17
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	10.9	12.7	17.8	20.2
HCM LOS	B	B	C	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	0%	26%	71%	8%
Vol Thru, %	96%	0%	35%	10%	88%
Vol Right, %	0%	100%	39%	19%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	423	192	69	168	438
LT Vol	406	0	24	16	387
Through Vol	0	192	27	32	17
RT Vol	17	0	18	120	34
Lane Flow Rate	423	192	69	168	438
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.697	0.277	0.13	0.31	0.685
Departure Headway (Hd)	5.931	5.2	6.764	6.639	5.634
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	609	687	526	539	639
Service Time	3.69	2.959	4.86	4.717	3.694
HCM Lane V/C Ratio	0.695	0.279	0.131	0.312	0.685
HCM Control Delay	21.3	10	10.9	12.7	20.2
HCM Lane LOS	C	A	B	B	C
HCM 95th-tile Q	5.5	1.1	0.4	1.3	5.4

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
11: Old Redwood Highway/Old Redwood Highway #2 & Valparaiso Avenue/Myrtle Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	84	32	60	38	62	41	497	158	95	378	10
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
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1769		1770	1642		1770	1863	1540	1770	1863	1532
Flt Permitted	0.69	1.00		0.68	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1290	1769		1271	1642		1770	1863	1540	1770	1863	1532
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	84	32	60	38	62	41	497	158	95	378	10
RTOR Reduction (vph)	0	16	0	0	52	0	0	0	78	0	0	4
Lane Group Flow (vph)	6	100	0	60	48	0	41	497	80	95	378	6
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	8.6	8.6		8.6	8.6		2.6	28.0	28.0	6.8	32.2	32.2
Effective Green, g (s)	8.6	8.6		8.6	8.6		2.6	28.0	28.0	6.8	32.2	32.2
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.05	0.51	0.51	0.12	0.58	0.58
Clearance 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)	200	274		197	254		83	941	778	217	1082	890
v/s Ratio Prot		c0.06			0.03		0.02	c0.27		c0.05	0.20	
v/s Ratio Perm	0.00			0.05					0.05			0.00
v/c Ratio	0.03	0.36		0.30	0.19		0.49	0.53	0.10	0.44	0.35	0.01
Uniform Delay, d1	19.9	21.0		20.7	20.4		25.8	9.2	7.1	22.5	6.1	4.9
Progression Factor	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	0.8		0.9	0.4		4.6	0.5	0.1	1.4	0.2	0.0
Delay (s)	19.9	21.8		21.6	20.7		30.3	9.8	7.2	23.9	6.3	4.9
Level of Service	B	C		C	C		C	A	A	C	A	A
Approach Delay (s)		21.7			21.1			10.4			9.7	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	55.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 AWSC
12: SB US 101 On-ramp/West School Road & West Sierra Avenue #4

Intersection	
Intersection Delay, s/veh	13.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	201	12	284	214	63	0	0	0	35	9	1
Peak Hour 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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	201	12	284	214	63	0	0	0	35	9	1
Number of Lanes	0	1	0	0	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	9.4	15.8	9.3
HCM LOS	A	C	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	51%	78%
Vol Thru, %	93%	38%	20%
Vol Right, %	6%	11%	2%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	216	561	45
LT Vol	201	214	9
Through Vol	12	63	1
RT Vol	3	284	35
Lane Flow Rate	216	561	45
Geometry Grp	1	1	1
Degree of Util (X)	0.276	0.674	0.072
Departure Headway (Hd)	4.6	4.328	5.757
Convergence, Y/N	Yes	Yes	Yes
Cap	782	836	621
Service Time	2.627	2.348	3.807
HCM Lane V/C Ratio	0.276	0.671	0.072
HCM Control Delay	9.4	15.8	9.3
HCM Lane LOS	A	C	A
HCM 95th-tile Q	1.1	5.4	0.2

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Unsignalized Intersection Capacity Analysis
13: NB US 101 Off-ramp & West Sierra Avenue #4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	236	0	0	512	49	459
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	236	0	0	512	49	459
Pedestrians	1			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			236		749	237
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			236		749	237
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		87	43
cM capacity (veh/h)			1331		379	801

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	236	512	49	459
Volume Left	0	0	49	0
Volume Right	0	0	0	459
cSH	1700	1700	379	801
Volume to Capacity	0.14	0.30	0.13	0.57
Queue Length 95th (ft)	0	0	11	93
Control Delay (s)	0.0	0.0	15.9	15.3
Lane LOS			C	C
Approach Delay (s)	0.0	0.0	15.4	
Approach LOS			C	

Intersection Summary			
Average Delay		6.2	
Intersection Capacity Utilization		47.6%	ICU Level of Service A
Analysis Period (min)		15	

HCM 2010 AWSC
14: West Sierra Avenue #4 & East School Street

Intersection	
Intersection Delay, s/veh	18.8
Intersection LOS	C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	39	536	479	51	43	21
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	536	479	51	43	21
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	20.8	17.7	10.1
HCM LOS	C	C	B

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	0%	67%
Vol Thru, %	93%	90%	0%
Vol Right, %	0%	10%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	575	530	64
LT Vol	536	479	0
Through Vol	0	51	21
RT Vol	39	0	43
Lane Flow Rate	575	530	64
Geometry Grp	1	1	1
Degree of Util (X)	0.753	0.692	0.113
Departure Headway (Hd)	4.716	4.697	6.337
Convergence, Y/N	Yes	Yes	Yes
Cap	759	763	569
Service Time	2.78	2.762	4.337
HCM Lane V/C Ratio	0.758	0.695	0.112
HCM Control Delay	20.8	17.7	10.1
HCM Lane LOS	C	C	B
HCM 95th-tile Q	7	5.6	0.4

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
15: Charles Street & East Cotati Avenue #3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1152	9	156	980	6	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		3.0	4.0	3.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	0.94	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1673		1770	1863	1512	
Flt Permitted	1.00		0.10	1.00	1.00	
Satd. Flow (perm)	1673		184	1863	1512	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1152	9	156	980	6	249
RTOR Reduction (vph)	0	0	0	0	159	0
Lane Group Flow (vph)	1161	0	156	980	96	0
Confl. Peds. (#/hr)		30	10		11	10
Confl. Bikes (#/hr)		5				5
Parking (#/hr)	0					
Turn Type	NA		pm+pt	NA	NA	
Protected Phases	4		3	8	2	
Permitted Phases			8			
Actuated Green, G (s)	81.0		90.1	90.1	13.0	
Effective Green, g (s)	81.0		90.1	90.1	13.0	
Actuated g/C Ratio	0.74		0.82	0.82	0.12	
Clearance Time (s)	4.0		3.0	4.0	3.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1230		238	1524	178	
v/s Ratio Prot	c0.69		0.04	c0.53	c0.06	
v/s Ratio Perm			0.50			
v/c Ratio	0.94		0.66	0.64	0.54	
Uniform Delay, d1	12.6		20.1	3.8	45.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	14.2		6.4	0.9	3.3	
Delay (s)	26.8		26.4	4.8	49.1	
Level of Service	C		C	A	D	
Approach Delay (s)	26.8			7.7	49.1	
Approach LOS	C			A	D	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Lasalle Avenue & East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	1182	215	73	937	3	190	0	73	6	1	10
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	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	0.97		1.00	1.00			0.97			0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.96			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1770	3356		1770	3535			1680			1581	
Flt Permitted	0.95	1.00		0.95	1.00			0.78			0.92	
Satd. Flow (perm)	1770	3356		1770	3535			1350			1480	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	1182	215	73	937	3	190	0	73	6	1	10
RTOR Reduction (vph)	0	14	0	0	0	0	0	48	0	0	8	0
Lane Group Flow (vph)	3	1383	0	73	940	0	0	215	0	0	9	0
Confl. Peds. (#/hr)			60			60			60			60
Confl. Bikes (#/hr)			30			30			30			30
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	0.7	44.4		5.2	48.9			17.3			17.3	
Effective Green, g (s)	0.7	44.4		5.2	48.9			17.3			17.3	
Actuated g/C Ratio	0.01	0.56		0.07	0.62			0.22			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)	15	1888		116	2190			296			324	
v/s Ratio Prot	0.00	c0.41		c0.04	0.27							
v/s Ratio Perm								c0.16			0.01	
v/c Ratio	0.20	0.73		0.63	0.43			0.73			0.03	
Uniform Delay, d1	38.8	12.8		35.9	7.8			28.6			24.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	6.5	1.5		10.2	0.1			8.6			0.0	
Delay (s)	45.3	14.3		46.1	7.9			37.2			24.2	
Level of Service	D	B		D	A			D			C	
Approach Delay (s)		14.4			10.7			37.2			24.2	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	78.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: East Cotati Avenue #3 & Adrian Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	153	1088	21	35	881	86	20	1	20	119	0	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	10
Total Lost time (s)	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
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (prot)	1770	3529		1770	3473			1699			1770	1400
Flt Permitted	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (perm)	1770	3529		1770	3473			1699			1770	1400
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	1088	21	35	881	86	20	1	20	119	0	133
RTOR Reduction (vph)	0	1	0	0	5	0	0	19	0	0	0	116
Lane Group Flow (vph)	153	1108	0	35	962	0	0	22	0	0	119	17
Confl. Peds. (#/hr)	17					11				11		17
Confl. Bikes (#/hr)						10						10
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												4
Actuated Green, G (s)	12.7	61.4		2.6	51.3			7.1			12.9	12.9
Effective Green, g (s)	12.7	61.4		2.6	51.3			7.1			12.9	12.9
Actuated g/C Ratio	0.13	0.61		0.03	0.51			0.07			0.13	0.13
Clearance Time (s)	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
Lane Grp Cap (vph)	224	2166		46	1781			120			228	180
v/s Ratio Prot	c0.09	0.31		0.02	c0.28			c0.01			c0.07	
v/s Ratio Perm												0.01
v/c Ratio	0.68	0.51		0.76	0.54			0.19			0.52	0.10
Uniform Delay, d1	41.7	10.9		48.4	16.4			43.7			40.7	38.4
Progression Factor	1.00	1.00		0.77	0.46			1.00			1.00	1.00
Incremental Delay, d2	8.3	0.9		50.1	1.1			0.8			2.2	0.2
Delay (s)	50.0	11.7		87.2	8.7			44.5			42.8	38.6
Level of Service	D	B		F	A			D			D	D
Approach Delay (s)		16.4			11.5			44.5			40.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
18: Lancaster Drive & East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	1010	201	143	882	8	122	0	142	1	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00			1.00	0.93	1.00	0.93	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97	1.00	0.97	1.00	
Frt	1.00	0.98		1.00	1.00			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	3397		1770	3531			1712	1476	1654	1468	
Flt Permitted	0.95	1.00		0.95	1.00			0.75	1.00	0.57	1.00	
Satd. Flow (perm)	1770	3397		1770	3531			1360	1476	997	1468	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	1010	201	143	882	8	122	0	142	1	0	5
RTOR Reduction (vph)	0	14	0	0	0	0	0	0	122	0	4	0
Lane Group Flow (vph)	15	1197	0	143	890	0	0	122	20	1	1	0
Confl. Peds. (#/hr)	28		23	24		29	23		24	29		28
Confl. Bikes (#/hr)			15			15			15			15
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	12.3	58.7		15.0	61.4			14.3	14.3	14.3	14.3	
Effective Green, g (s)	12.3	58.7		15.0	61.4			14.3	14.3	14.3	14.3	
Actuated g/C Ratio	0.12	0.59		0.15	0.61			0.14	0.14	0.14	0.14	
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)	217	1994		265	2168			194	211	142	209	
v/s Ratio Prot	0.01	c0.35		c0.08	0.25						0.00	
v/s Ratio Perm								c0.09	0.01	0.00		
v/c Ratio	0.07	0.60		0.54	0.41			0.63	0.10	0.01	0.00	
Uniform Delay, d1	38.8	13.2		39.3	10.0			40.4	37.2	36.8	36.7	
Progression Factor	0.78	0.42		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.2		2.1	0.6			6.2	0.2	0.0	0.0	
Delay (s)	30.2	6.7		41.4	10.5			46.6	37.4	36.8	36.7	
Level of Service	C	A		D	B			D	D	D	D	
Approach Delay (s)		7.0			14.8			41.7			36.8	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
19: Santero Way & East Cotati Avenue #3/East Cotati Avenue

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	964	137	50	861	263	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3456		1770	3539	1770	1537
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3456		1770	3539	1770	1537
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	964	137	50	861	263	47
RTOR Reduction (vph)	12	0	0	0	0	35
Lane Group Flow (vph)	1089	0	50	861	263	12
Confl. Peds. (#/hr)		5	5		5	5
Confl. Bikes (#/hr)		15				15
Turn Type	NA		Prot	NA	NA	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	27.7		3.0	34.7	14.9	14.9
Effective Green, g (s)	27.7		3.0	34.7	14.9	14.9
Actuated g/C Ratio	0.48		0.05	0.60	0.26	0.26
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1662		92	2132	457	397
v/s Ratio Prot	c0.32		0.03	c0.24	c0.15	
v/s Ratio Perm						0.01
v/c Ratio	0.65		0.54	0.40	0.58	0.03
Uniform Delay, d1	11.3		26.6	6.0	18.6	16.0
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9		6.4	0.1	1.8	0.0
Delay (s)	12.3		33.0	6.1	20.4	16.0
Level of Service	B		C	A	C	B
Approach Delay (s)	12.3			7.6	19.7	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	57.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
20: Madrone Avenue & Gravenstein Highway/Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	838	36	80	1207	180	36	16	84	257	28	91
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
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.87		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)	1770	3390		1770	1792	1583	1770	1628		1770	1863	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)	1770	3390		1770	1792	1583	1770	1628		1770	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	65	838	36	80	1207	180	36	16	84	257	28	91
RTOR Reduction (vph)	0	4	0	0	0	45	0	81	0	0	0	72
Lane Group Flow (vph)	65	870	0	80	1207	135	36	19	0	257	28	19
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases						6						4
Actuated Green, G (s)	4.8	41.2		23.2	59.6	75.2	3.6	4.0		15.6	16.0	20.8
Effective Green, g (s)	4.8	41.2		23.2	59.6	75.2	3.6	4.0		15.6	16.0	20.8
Actuated g/C Ratio	0.05	0.41		0.23	0.60	0.75	0.04	0.04		0.16	0.16	0.21
Clearance 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)	84	1396		410	1068	1253	63	65		276	298	329
v/s Ratio Prot	c0.04	0.26		0.05	c0.67	0.02	c0.02	0.01		c0.15	0.02	0.00
v/s Ratio Perm						0.07						0.01
v/c Ratio	0.77	0.62		0.20	1.13	0.11	0.57	0.30		0.93	0.09	0.06
Uniform Delay, d1	47.1	23.3		30.9	20.2	3.3	47.4	46.6		41.7	35.8	31.7
Progression Factor	1.00	1.00		0.71	0.30	0.02	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	34.8	0.9		0.2	68.5	0.0	11.9	2.6		36.1	0.1	0.1
Delay (s)	81.9	24.1		22.2	74.5	0.1	59.4	49.2		77.8	36.0	31.8
Level of Service	F	C		C	E	A	E	D		E	D	C
Approach Delay (s)		28.1			62.5			51.9			63.6	
Approach LOS		C			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection Level of Service Calculations
Buildout to Sphere of Influence

HCM Signalized Intersection Capacity Analysis
1: New N-S Street & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	979	6	48	845	756	3	16	32	162	5	46
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	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3403		1770	3406	1583	1770	1863	1583	3433	1611	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3403		1770	3406	1583	1770	1863	1583	3433	1611	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	253	979	6	48	845	756	3	16	32	162	5	46
RTOR Reduction (vph)	0	0	0	0	0	101	0	0	30	0	35	0
Lane Group Flow (vph)	253	985	0	48	845	655	3	16	2	162	16	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases						6			8			
Actuated Green, G (s)	21.8	57.0		5.8	41.0	66.6	0.8	1.6	7.4	25.6	26.4	
Effective Green, g (s)	21.8	57.0		5.8	41.0	66.6	0.8	1.6	7.4	25.6	26.4	
Actuated g/C Ratio	0.21	0.54		0.05	0.39	0.63	0.01	0.02	0.07	0.24	0.25	
Clearance 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)	364	1829		96	1317	1054	13	28	110	829	401	
v/s Ratio Prot	c0.14	0.29		0.03	c0.25	c0.15	0.00	c0.01	0.00	0.05	0.01	
v/s Ratio Perm						0.26			0.00			
v/c Ratio	0.70	0.54		0.50	0.64	0.62	0.23	0.57	0.02	0.20	0.04	
Uniform Delay, d1	39.0	15.9		48.7	26.5	12.0	52.3	51.9	45.9	32.0	30.2	
Progression Factor	0.64	0.30		0.96	0.47	0.03	1.08	1.05	1.00	1.00	1.00	
Incremental Delay, d2	5.1	1.0		3.0	1.8	0.8	8.9	25.1	0.1	0.1	0.0	
Delay (s)	30.0	5.8		49.9	14.1	1.2	65.5	79.7	46.0	32.1	30.2	
Level of Service	C	A		D	B	A	E	E	D	C	C	
Approach Delay (s)		10.7			9.2			57.7			31.7	
Approach LOS		B			A			E			C	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: West Cotati Avenue & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	1145	16	74	1641	181	23	9	80	42	3	9
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	0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	3400		1770	3368			1798	1583	1681	1696	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1770	3400		1770	3368			1798	1583	1681	1696	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	41	1145	16	74	1641	181	23	9	80	42	3	9
RTOR Reduction (vph)	0	1	0	0	6	0	0	0	70	0	0	8
Lane Group Flow (vph)	41	1160	0	74	1816	0	0	32	10	22	23	1
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8	1	4	4	5
Permitted Phases									8			4
Actuated Green, G (s)	3.6	72.8		8.8	78.0			3.9	12.7	4.5	4.5	8.1
Effective Green, g (s)	3.6	72.8		8.8	78.0			3.9	12.7	4.5	4.5	8.1
Actuated g/C Ratio	0.03	0.69		0.08	0.74			0.04	0.12	0.04	0.04	0.08
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)	60	2335		146	2478			66	189	71	72	120
v/s Ratio Prot	0.02	c0.34		0.04	c0.54			c0.02	0.00	0.01	c0.01	0.00
v/s Ratio Perm									0.00			0.00
v/c Ratio	0.68	0.50		0.51	0.73			0.48	0.05	0.31	0.32	0.01
Uniform Delay, d1	50.6	7.9		46.5	8.0			50.1	41.3	49.2	49.3	45.2
Progression Factor	1.22	0.30		0.59	0.18			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.5	0.7		1.5	1.1			5.5	0.1	2.5	2.6	0.0
Delay (s)	87.4	3.1		29.2	2.5			55.6	41.4	51.7	51.8	45.2
Level of Service	F	A		C	A			E	D	D	D	D
Approach Delay (s)		6.0			3.6			45.5			50.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Redwood Drive & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	112	1149	28	38	1736	645	28	24	38	493	35	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	12	12	12	12	11	12
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	0.96		1.00	1.00	0.98
Flpb, ped/bikes	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		1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	1711	4802		1770	3471	1564	1770	1622		1681	1639	1546
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	1711	4802		1770	3471	1564	1770	1622		1681	1639	1546
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	112	1149	28	38	1736	645	28	24	38	493	35	145
RTOR Reduction (vph)	0	2	0	0	0	58	0	37	0	0	0	109
Lane Group Flow (vph)	112	1175	0	38	1736	587	28	25	0	261	267	36
Confl. Peds. (#/hr)			4			2			2			4
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	4%	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6	7	8	8		7	7	
Permitted Phases						6						7
Actuated Green, G (s)	8.6	63.7		3.6	58.7	78.2	3.2	3.2		19.5	19.5	19.5
Effective Green, g (s)	8.6	63.7		3.6	58.7	78.2	3.2	3.2		19.5	19.5	19.5
Actuated g/C Ratio	0.08	0.60		0.03	0.55	0.74	0.03	0.03		0.18	0.18	0.18
Clearance 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)	138	2885		60	1922	1212	53	48		309	301	284
v/s Ratio Prot	c0.07	0.24		0.02	c0.50	0.09	c0.02	0.02		0.16	c0.16	
v/s Ratio Perm						0.29						0.02
v/c Ratio	0.81	0.41		0.63	0.90	0.48	0.53	0.52		0.84	0.89	0.13
Uniform Delay, d1	47.9	11.2		50.5	21.1	5.7	50.7	50.6		41.8	42.2	36.1
Progression Factor	0.76	0.44		1.05	0.70	0.31	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	27.2	0.4		12.6	4.8	0.2	9.2	9.9		18.6	25.3	0.2
Delay (s)	63.7	5.3		65.7	19.6	1.9	59.8	60.6		60.4	67.5	36.3
Level of Service	E	A		E	B	A	E	E		E	E	D
Approach Delay (s)		10.3			15.6			60.4			58.0	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	978	714	231	1447	0	0	0	0	555	1	926
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	0.95	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	0.98	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3406	1437	1770	3406					3433	1426	1425
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3406	1437	1770	3406					3433	1426	1425
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	978	714	231	1447	0	0	0	0	555	1	926
RTOR Reduction (vph)	0	0	445	0	0	0	0	0	0	0	23	33
Lane Group Flow (vph)	0	978	269	231	1447	0	0	0	0	555	441	430
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			5									5
Heavy Vehicles (%)	2%	6%	6%	2%	6%	6%	6%	6%	6%	2%	2%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		40.0	40.0	16.8	60.8					37.2	37.2	37.2
Effective Green, g (s)		40.0	40.0	16.8	60.8					37.2	37.2	37.2
Actuated g/C Ratio		0.38	0.38	0.16	0.57					0.35	0.35	0.35
Clearance Time (s)		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
Lane Grp Cap (vph)		1285	542	280	1953					1204	500	500
v/s Ratio Prot		0.29		c0.13	c0.42					0.16	c0.31	
v/s Ratio Perm			0.19									0.30
v/c Ratio		0.76	0.50	0.82	0.74					0.46	0.88	0.86
Uniform Delay, d1		28.8	25.3	43.2	16.8					26.6	32.3	32.0
Progression Factor		0.80	1.62	1.54	0.33					1.00	1.00	1.00
Incremental Delay, d2		3.7	2.8	17.2	2.2					0.3	16.6	13.8
Delay (s)		26.6	43.8	83.8	7.7					26.9	49.0	45.7
Level of Service		C	D	F	A					C	D	D
Approach Delay (s)		33.9			18.2			0.0			39.7	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	121.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1533	0	0	871	807	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.91	0.97	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3406			5085	3303	1549
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3406			5085	3303	1549
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1533	0	0	871	807	197
RTOR Reduction (vph)	0	0	0	0	0	23
Lane Group Flow (vph)	1533	0	0	871	807	174
Confl. Peds. (#/hr)						5
Confl. Bikes (#/hr)						5
Heavy Vehicles (%)	6%	2%	2%	2%	6%	2%
Turn Type	NA			NA	NA	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	65.1			65.1	32.9	32.9
Effective Green, g (s)	65.1			65.1	32.9	32.9
Actuated g/C Ratio	0.61			0.61	0.31	0.31
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)	2091			3122	1025	480
v/s Ratio Prot	c0.45			0.17	c0.24	
v/s Ratio Perm						0.11
v/c Ratio	0.73			0.28	0.79	0.36
Uniform Delay, d1	14.4			9.5	33.4	28.4
Progression Factor	0.26			0.75	1.00	1.00
Incremental Delay, d2	1.8			0.2	4.1	0.5
Delay (s)	5.4			7.3	37.4	28.9
Level of Service	A			A	D	C
Approach Delay (s)	5.4			7.3	35.7	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	121.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Old Redwood Highway #1/NB US 101 On-ramp & Commerce Boulevard

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	314	159	809	534	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	11	12	12	12
Total Lost time (s)	4.0	4.0	4.5	4.0		
Lane Util. Factor	1.00	1.00	0.95	1.00		
Frt	1.00	0.85	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1888	1689	3355	1583		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1888	1689	3355	1583		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	314	159	809	534	0	0
RTOR Reduction (vph)	0	79	0	0	0	0
Lane Group Flow (vph)	314	80	809	534	0	0
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%
Turn Type	NA	Perm	NA	Free		
Protected Phases	7		6			
Permitted Phases		7		Free		
Actuated Green, G (s)	14.1	14.1	30.4	53.0		
Effective Green, g (s)	14.1	14.1	30.4	53.0		
Actuated g/C Ratio	0.27	0.27	0.57	1.00		
Clearance Time (s)	4.0	4.0	4.5			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	502	449	1924	1583		
v/s Ratio Prot	c0.17		c0.24			
v/s Ratio Perm		0.05		0.34		
v/c Ratio	0.63	0.18	0.42	0.34		
Uniform Delay, d1	17.1	15.0	6.3	0.0		
Progression Factor	1.00	1.00	0.68	1.00		
Incremental Delay, d2	2.4	0.2	0.5	0.5		
Delay (s)	19.6	15.2	4.9	0.5		
Level of Service	B	B	A	A		
Approach Delay (s)	18.1		3.1			0.0
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	53.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Old Redwood Highway #1 & Gravenstein Hwy #5/Gravenstein Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	721	39	957	30	55	28	617	628	9	3	131	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	14	12
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	0.97	1.00	1.00	1.00	1.00		0.97	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.95		1.00	1.00			1.00	1.00
Flpb, ped/bikes	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	0.95		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	3367	1863	1548	1770	1682		3433	1857			1985	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (perm)	3367	1863	1548	1770	1682		3433	1857			1958	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	721	39	957	30	55	28	617	628	9	3	131	213
RTOR Reduction (vph)	0	0	0	0	18	0	0	1	0	0	0	0
Lane Group Flow (vph)	721	39	957	30	65	0	617	636	0	0	134	213
Confl. Peds. (#/hr)			20			20			20			20
Confl. Bikes (#/hr)			20			20			20			20
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Free	Prot	NA		Prot	NA		Perm	NA	pt+ov
Protected Phases	5	2		1	6		3	8			4	4 5
Permitted Phases			Free							4		
Actuated Green, G (s)	42.4	45.8	106.0	4.3	7.7		23.4	43.9			16.5	62.9
Effective Green, g (s)	42.4	45.8	106.0	4.3	7.7		23.4	43.9			16.5	62.9
Actuated g/C Ratio	0.40	0.43	1.00	0.04	0.07		0.22	0.41			0.16	0.59
Clearance Time (s)	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	
Lane Grp Cap (vph)	1346	804	1548	71	122		757	769			304	939
v/s Ratio Prot	0.21	0.02		0.02	0.04		0.18	c0.34				0.13
v/s Ratio Perm			c0.62								0.07	
v/c Ratio	0.54	0.05	0.62	0.42	0.54		0.82	0.83			0.44	0.23
Uniform Delay, d1	24.3	17.5	0.0	49.6	47.4		39.2	27.7			40.6	10.1
Progression Factor	0.55	0.66	1.00	1.00	1.00		1.00	1.00			1.06	0.71
Incremental Delay, d2	1.1	0.0	1.3	4.0	4.5		6.7	7.3			1.0	0.1
Delay (s)	14.4	11.5	1.3	53.7	51.9		46.0	35.0			43.9	7.3
Level of Service	B	B	A	D	D		D	C			D	A
Approach Delay (s)		7.1			52.4			40.4			21.5	
Approach LOS		A			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	83.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
8: Old Redwood Highway #1 & William Street/George Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	1	14	18	2	31	13	1078	4	14	1042	45
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.95		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.96			0.98		0.98	1.00		0.98	1.00	
Frt		0.98			0.92		1.00	1.00		1.00	0.99	
Flt Protected		0.96			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1493			1409		1556	3182		1556	3148	
Flt Permitted		0.73			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1132			1259		1556	3182		1556	3148	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	71	1	14	18	2	31	13	1078	4	14	1042	45
RTOR Reduction (vph)	0	11	0	0	27	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	75	0	0	24	0	13	1082	0	14	1084	0
Confl. Peds. (#/hr)	60		60	60		60	60		60	60		60
Confl. Bikes (#/hr)			20			20			20			20
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		8.4			8.4		0.6	36.9		0.6	36.9	
Effective Green, g (s)		8.4			8.4		0.6	36.9		0.6	36.9	
Actuated g/C Ratio		0.15			0.15		0.01	0.64		0.01	0.64	
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)		164			182		16	2027		16	2006	
v/s Ratio Prot							0.01	0.34		c0.01	c0.34	
v/s Ratio Perm		c0.07			0.02							
v/c Ratio		0.46			0.13		0.81	0.53		0.88	0.54	
Uniform Delay, d1		22.7			21.6		28.6	5.8		28.6	5.8	
Progression Factor		1.05			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.0			0.3		132.2	0.3		161.3	0.3	
Delay (s)		25.8			21.9		160.8	6.0		189.9	6.1	
Level of Service		C			C		F	A		F	A	
Approach Delay (s)		25.8			21.9			7.9			8.4	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Old Redwood Highway #2/Old Redwood Highway #1 & West Sierra Avenue #4/East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	268	4	0	360	542	9	409	17	611	317	123
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	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.83		1.00	0.95	1.00	1.00		1.00	0.98	
Flpb, ped/bikes	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	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1313		1863	1509	1770	3506		3433	1745	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1313		1863	1509	1770	3506		3433	1745	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	148	268	4	0	360	542	9	409	17	611	317	123
RTOR Reduction (vph)	0	0	3	0	0	70	0	3	0	0	14	0
Lane Group Flow (vph)	148	268	1	0	360	472	9	423	0	611	426	0
Confl. Peds. (#/hr)			50			50			50			50
Confl. Bikes (#/hr)			20			20			20			20
Turn Type	Prot	NA	Perm		NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	5	2			6	7	3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	9.0	32.2	32.2		19.2	37.7	0.8	29.3		18.5	47.0	
Effective Green, g (s)	9.0	32.2	32.2		19.2	37.7	0.8	29.3		18.5	47.0	
Actuated g/C Ratio	0.10	0.35	0.35		0.21	0.41	0.01	0.32		0.20	0.51	
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)	173	652	459		388	683	15	1116		690	891	
v/s Ratio Prot	c0.08	0.14			c0.19	c0.14	0.01	0.12		c0.18	c0.24	
v/s Ratio Perm			0.00			0.17						
v/c Ratio	0.86	0.41	0.00		0.93	0.69	0.60	0.38		0.89	0.48	
Uniform Delay, d1	40.9	22.7	19.5		35.7	22.4	45.4	24.3		35.7	14.6	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	31.5	0.4	0.0		28.0	3.0	51.0	0.2		13.0	0.4	
Delay (s)	72.4	23.1	19.5		63.7	25.4	96.5	24.5		48.7	15.0	
Level of Service	E	C	B		E	C	F	C		D	B	
Approach Delay (s)		40.4			40.7			26.0			34.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 AWSC
10: Old Redwood Highway #2 & Henry Street/Charles Street

Intersection	
Intersection Delay, s/veh	16.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	26	17	39	169	14	15	11	417	81	9	300	10
Peak Hour 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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	17	39	169	14	15	11	417	81	9	300	10
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	10.6	13	19.4	14.5
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	0%	32%	85%	3%
Vol Thru, %	97%	0%	21%	7%	94%
Vol Right, %	0%	100%	48%	8%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	428	81	82	198	319
LT Vol	417	0	17	14	300
Through Vol	0	81	39	15	10
RT Vol	11	0	26	169	9
Lane Flow Rate	428	81	82	198	319
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.701	0.116	0.146	0.352	0.506
Departure Headway (Hd)	5.899	5.176	6.395	6.406	5.709
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	612	689	556	558	628
Service Time	3.656	2.933	4.486	4.481	3.774
HCM Lane V/C Ratio	0.699	0.118	0.147	0.355	0.508
HCM Control Delay	21.4	8.6	10.6	13	14.5
HCM Lane LOS	C	A	B	B	B
HCM 95th-tile Q	5.6	0.4	0.5	1.6	2.9

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
11: Old Redwood Highway/Old Redwood Highway #2 & Valparaiso Avenue/Myrtle Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	45	68	167	62	45	42	461	109	49	420	3
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
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1665		1770	1716		1770	1863	1539	1770	1863	1531
Flt Permitted	0.69	1.00		0.68	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1281	1665		1275	1716		1770	1863	1539	1770	1863	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	45	68	167	62	45	42	461	109	49	420	3
RTOR Reduction (vph)	0	50	0	0	26	0	0	0	61	0	0	2
Lane Group Flow (vph)	6	63	0	167	81	0	42	461	48	49	420	1
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	14.1	14.1		14.1	14.1		2.6	23.2	23.2	3.5	24.1	24.1
Effective Green, g (s)	14.1	14.1		14.1	14.1		2.6	23.2	23.2	3.5	24.1	24.1
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.05	0.44	0.44	0.07	0.46	0.46
Clearance 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)	342	444		340	458		87	818	676	117	850	698
v/s Ratio Prot		0.04			0.05		0.02	c0.25		c0.03	0.23	
v/s Ratio Perm	0.00			c0.13					0.03			0.00
v/c Ratio	0.02	0.14		0.49	0.18		0.48	0.56	0.07	0.42	0.49	0.00
Uniform Delay, d1	14.2	14.7		16.3	14.9		24.4	11.0	8.6	23.7	10.1	7.8
Progression Factor	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	0.1		1.1	0.2		4.2	0.9	0.0	2.4	0.5	0.0
Delay (s)	14.3	14.9		17.4	15.1		28.6	11.9	8.6	26.1	10.5	7.8
Level of Service	B	B		B	B		C	B	A	C	B	A
Approach Delay (s)		14.9			16.5			12.5			12.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	52.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 AWSC
12: SB US 101 On-ramp/West School Road & West Sierra Avenue #4

Intersection	
Intersection Delay, s/veh	25.2
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	184	48	371	309	38	0	0	0	37	21	5
Peak Hour 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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	184	48	371	309	38	0	0	0	37	21	5
Number of Lanes	0	1	0	0	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	9.9	31.6	9.9
HCM LOS	A	D	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	52%	59%
Vol Thru, %	78%	43%	33%
Vol Right, %	20%	5%	8%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	235	718	63
LT Vol	184	309	21
Through Vol	48	38	5
RT Vol	3	371	37
Lane Flow Rate	235	718	63
Geometry Grp	1	1	1
Degree of Util (X)	0.31	0.888	0.106
Departure Headway (Hd)	4.753	4.453	6.079
Convergence, Y/N	Yes	Yes	Yes
Cap	754	811	586
Service Time	2.801	2.487	4.157
HCM Lane V/C Ratio	0.312	0.885	0.108
HCM Control Delay	9.9	31.6	9.9
HCM Lane LOS	A	D	A
HCM 95th-tile Q	1.3	11.7	0.4

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Unsignalized Intersection Capacity Analysis
13: NB US 101 Off-ramp & West Sierra Avenue #4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	221	0	0	675	43	430
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	221	0	0	675	43	430
Pedestrians	1			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			221		897	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			221		897	222
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		86	47
cM capacity (veh/h)			1348		310	817

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	221	675	43	430
Volume Left	0	0	43	0
Volume Right	0	0	0	430
cSH	1700	1700	310	817
Volume to Capacity	0.13	0.40	0.14	0.53
Queue Length 95th (ft)	0	0	12	78
Control Delay (s)	0.0	0.0	18.5	14.2
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	14.6	
Approach LOS			B	

Intersection Summary			
Average Delay		5.0	
Intersection Capacity Utilization		45.9%	ICU Level of Service	A
Analysis Period (min)		15	

HCM 2010 AWSC
14: West Sierra Avenue #4 & East School Street

Intersection	
Intersection Delay, s/veh	16.6
Intersection LOS	C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	16	537	465	21	30	29
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	537	465	21	30	29
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	18.4	15.4	9.7
HCM LOS	C	C	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	0%	51%
Vol Thru, %	97%	96%	0%
Vol Right, %	0%	4%	49%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	553	486	59
LT Vol	537	465	0
Through Vol	0	21	29
RT Vol	16	0	30
Lane Flow Rate	553	486	59
Geometry Grp	1	1	1
Degree of Util (X)	0.712	0.631	0.098
Departure Headway (Hd)	4.634	4.671	5.953
Convergence, Y/N	Yes	Yes	Yes
Cap	774	768	596
Service Time	2.685	2.724	4.053
HCM Lane V/C Ratio	0.714	0.633	0.099
HCM Control Delay	18.4	15.4	9.7
HCM Lane LOS	C	C	A
HCM 95th-tile Q	6.1	4.5	0.3

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
15: Charles Street & East Cotati Avenue #3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1000	3	206	997	1	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		3.0	4.0	3.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	0.94	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1675		1770	1863	1515	
Flt Permitted	1.00		0.15	1.00	1.00	
Satd. Flow (perm)	1675		286	1863	1515	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1000	3	206	997	1	105
RTOR Reduction (vph)	0	0	0	0	93	0
Lane Group Flow (vph)	1003	0	206	997	13	0
Confl. Peds. (#/hr)		30	10		11	10
Confl. Bikes (#/hr)		5				5
Parking (#/hr)	0					
Turn Type	NA		pm+pt	NA	NA	
Protected Phases	4		3	8	2	
Permitted Phases			8			
Actuated Green, G (s)	64.2		74.0	74.0	10.1	
Effective Green, g (s)	64.2		74.0	74.0	10.1	
Actuated g/C Ratio	0.70		0.81	0.81	0.11	
Clearance Time (s)	4.0		3.0	4.0	3.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1180		343	1513	167	
v/s Ratio Prot	c0.60		0.04	c0.54	c0.01	
v/s Ratio Perm			0.44			
v/c Ratio	0.85		0.60	0.66	0.08	
Uniform Delay, d1	9.9		11.2	3.5	36.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	5.9		3.0	1.1	0.2	
Delay (s)	15.8		14.1	4.5	36.5	
Level of Service	B		B	A	D	
Approach Delay (s)	15.8			6.2	36.5	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	91.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Lasalle Avenue & East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	925	128	56	1049	6	192	1	46	0	1	5
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	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00			0.98			0.92	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.97			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.96			1.00	
Satd. Flow (prot)	1770	3402		1770	3533			1713			1525	
Flt Permitted	0.95	1.00		0.95	1.00			0.76			1.00	
Satd. Flow (perm)	1770	3402		1770	3533			1362			1525	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	11	925	128	56	1049	6	192	1	46	0	1	5
RTOR Reduction (vph)	0	11	0	0	0	0	0	11	0	0	4	0
Lane Group Flow (vph)	11	1042	0	56	1055	0	0	228	0	0	2	0
Confl. Peds. (#/hr)			60			60			60			60
Confl. Bikes (#/hr)			30			30			30			30
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	0.6	35.6		3.6	38.6			17.2			17.2	
Effective Green, g (s)	0.6	35.6		3.6	38.6			17.2			17.2	
Actuated g/C Ratio	0.01	0.52		0.05	0.56			0.25			0.25	
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)	15	1770		93	1993			342			383	
v/s Ratio Prot	0.01	c0.31		c0.03	c0.30						0.00	
v/s Ratio Perm								c0.17				
v/c Ratio	0.73	0.59		0.60	0.53			0.67			0.01	
Uniform Delay, d1	33.8	11.3		31.7	9.3			23.0			19.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	103.2	0.5		10.5	0.3			4.8			0.0	
Delay (s)	137.1	11.8		42.2	9.5			27.9			19.2	
Level of Service	F	B		D	A			C			B	
Approach Delay (s)		13.1			11.2			27.9			19.2	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	68.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: East Cotati Avenue #3 & Adrian Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	112	702	35	35	930	134	40	5	55	121	5	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	10
Total Lost time (s)	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
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.98			0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (prot)	1770	3514		1770	3446			1691			1777	1401
Flt Permitted	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (perm)	1770	3514		1770	3446			1691			1777	1401
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	112	702	35	35	930	134	40	5	55	121	5	216
RTOR Reduction (vph)	0	3	0	0	8	0	0	50	0	0	0	135
Lane Group Flow (vph)	112	734	0	35	1056	0	0	50	0	0	126	81
Confl. Peds. (#/hr)	17					11				11		17
Confl. Bikes (#/hr)						10						10
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												4
Actuated Green, G (s)	9.9	54.0		7.7	51.8			9.1			13.2	13.2
Effective Green, g (s)	9.9	54.0		7.7	51.8			9.1			13.2	13.2
Actuated g/C Ratio	0.10	0.54		0.08	0.52			0.09			0.13	0.13
Clearance Time (s)	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
Lane Grp Cap (vph)	175	1897		136	1785			153			234	184
v/s Ratio Prot	c0.06	0.21		0.02	c0.31			c0.03			c0.07	
v/s Ratio Perm												0.06
v/c Ratio	0.64	0.39		0.26	0.59			0.33			0.54	0.44
Uniform Delay, d1	43.3	13.4		43.5	16.7			42.6			40.6	40.0
Progression Factor	1.00	1.00		0.82	0.69			1.00			1.00	1.00
Incremental Delay, d2	7.7	0.6		0.9	1.3			1.3			2.4	1.7
Delay (s)	51.1	14.0		36.8	12.9			43.8			42.9	41.6
Level of Service	D	B		D	B			D			D	D
Approach Delay (s)		18.9			13.6			43.8			42.1	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
18: Lancaster Drive & East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	741	123	125	969	3	172	1	231	9	1	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.94	1.00	0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97	1.00	0.97	1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3416		1770	3536			1718	1484	1661	1500	
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00	0.49	1.00	
Satd. Flow (perm)	1770	3416		1770	3536			1292	1484	849	1500	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	9	741	123	125	969	3	172	1	231	9	1	14
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	182	0	11	0
Lane Group Flow (vph)	9	853	0	125	972	0	0	173	49	9	4	0
Confl. Peds. (#/hr)	28		23	24		29	23		24	29		28
Confl. Bikes (#/hr)			15			15			15			15
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	3.2	54.0		15.4	66.2			18.6	18.6	18.6	18.6	
Effective Green, g (s)	3.2	54.0		15.4	66.2			18.6	18.6	18.6	18.6	
Actuated g/C Ratio	0.03	0.54		0.15	0.66			0.19	0.19	0.19	0.19	
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)	56	1844		272	2340			240	276	157	279	
v/s Ratio Prot	0.01	c0.25		c0.07	0.27						0.00	
v/s Ratio Perm								c0.13	0.03	0.01		
v/c Ratio	0.16	0.46		0.46	0.42			0.72	0.18	0.06	0.01	
Uniform Delay, d1	47.1	14.1		38.5	7.9			38.3	34.3	33.5	33.2	
Progression Factor	0.82	0.40		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8		1.2	0.5			10.2	0.3	0.2	0.0	
Delay (s)	39.9	6.5		39.7	8.4			48.4	34.6	33.6	33.2	
Level of Service	D	A		D	A			D	C	C	C	
Approach Delay (s)		6.8			12.0			40.5			33.4	
Approach LOS		A			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
19: Santero Way & East Cotati Avenue #3/East Cotati Avenue

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	627	218	35	1016	94	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3369		1770	3539	1770	1525
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3369		1770	3539	1770	1525
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	627	218	35	1016	94	21
RTOR Reduction (vph)	32	0	0	0	0	18
Lane Group Flow (vph)	813	0	35	1016	94	3
Confl. Peds. (#/hr)		5	5		5	5
Confl. Bikes (#/hr)		15				15
Turn Type	NA		Prot	NA	NA	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	27.4		2.4	33.8	7.7	7.7
Effective Green, g (s)	27.4		2.4	33.8	7.7	7.7
Actuated g/C Ratio	0.55		0.05	0.68	0.16	0.16
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1864		85	2416	275	237
v/s Ratio Prot	0.24		0.02	c0.29	c0.05	
v/s Ratio Perm						0.00
v/c Ratio	0.44		0.41	0.42	0.34	0.01
Uniform Delay, d1	6.5		22.9	3.5	18.6	17.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		3.2	0.1	0.7	0.0
Delay (s)	6.7		26.1	3.6	19.4	17.7
Level of Service	A		C	A	B	B
Approach Delay (s)	6.7			4.4	19.1	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	49.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
20: Madrone Avenue & Gravenstein Highway/Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	994	18	50	570	254	21	34	64	170	19	33
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	0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.95			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	3399		1770	3286			1828	1583	1681	1701	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.98	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1770	3399		1770	3286			1828	1583	1681	1701	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	994	18	50	570	254	21	34	64	170	19	33
RTOR Reduction (vph)	0	1	0	0	38	0	0	0	49	0	0	27
Lane Group Flow (vph)	60	1011	0	50	786	0	0	55	15	93	96	6
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8	1	4	4	5
Permitted Phases									8			4
Actuated Green, G (s)	7.5	53.3		18.2	64.0			7.2	25.4	11.3	11.3	18.8
Effective Green, g (s)	7.5	53.3		18.2	64.0			7.2	25.4	11.3	11.3	18.8
Actuated g/C Ratio	0.07	0.50		0.17	0.60			0.07	0.24	0.11	0.11	0.18
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)	125	1709		303	1984			124	379	179	181	280
v/s Ratio Prot	0.03	c0.30		0.03	c0.24			c0.03	0.01	0.06	c0.06	0.00
v/s Ratio Perm									0.00			0.00
v/c Ratio	0.48	0.59		0.17	0.40			0.44	0.04	0.52	0.53	0.02
Uniform Delay, d1	47.4	18.6		37.4	10.9			47.5	30.9	44.8	44.8	36.0
Progression Factor	1.00	1.00		0.47	0.01			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.6		0.2	0.5			2.5	0.0	2.5	3.0	0.0
Delay (s)	50.3	19.2		17.9	0.6			50.0	31.0	47.3	47.8	36.0
Level of Service	D	B		B	A			D	C	D	D	D
Approach Delay (s)		20.9			1.6			39.8			45.9	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: New N-S Street & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	1192	38	96	1379	339	40	7	117	853	18	328
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	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3394		1770	3406	1583	1770	1863	1583	3433	1598	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3394		1770	3406	1583	1770	1863	1583	3433	1598	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	141	1192	38	96	1379	339	40	7	117	853	18	328
RTOR Reduction (vph)	0	2	0	0	0	84	0	0	106	0	199	0
Lane Group Flow (vph)	141	1228	0	96	1379	255	40	7	11	853	147	0
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases						6			8			
Actuated Green, G (s)	13.0	58.9		10.8	56.7	90.2	5.6	0.8	11.6	33.5	28.7	
Effective Green, g (s)	13.0	58.9		10.8	56.7	90.2	5.6	0.8	11.6	33.5	28.7	
Actuated g/C Ratio	0.11	0.49		0.09	0.47	0.75	0.05	0.01	0.10	0.28	0.24	
Clearance 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)	191	1665		159	1609	1189	82	12	205	958	382	
v/s Ratio Prot	0.08	c0.36		0.05	c0.40	0.06	0.02	0.00	0.00	c0.25	c0.09	
v/s Ratio Perm						0.10			0.00			
v/c Ratio	0.74	0.74		0.60	0.86	0.21	0.49	0.58	0.06	0.89	0.38	
Uniform Delay, d1	51.9	24.4		52.5	28.1	4.4	55.8	59.4	49.2	41.5	38.2	
Progression Factor	0.67	0.34		1.10	0.50	0.44	1.04	1.12	1.33	1.00	1.00	
Incremental Delay, d2	11.8	2.5		4.0	4.0	0.1	4.5	56.2	0.1	10.4	0.6	
Delay (s)	46.7	10.8		61.8	17.9	2.0	62.5	122.6	65.8	51.9	38.9	
Level of Service	D	B		E	B	A	E	F	E	D	D	
Approach Delay (s)		14.5			17.2			67.4			48.1	
Approach LOS		B			B			E			D	

Intersection Summary				
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: West Cotati Avenue & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	84	2045	36	143	1665	168	28	6	127	282	10	110
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	0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	3399		1770	3370			1789	1583	1681	1691	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1770	3399		1770	3370			1789	1583	1681	1691	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	84	2045	36	143	1665	168	28	6	127	282	10	110
RTOR Reduction (vph)	0	1	0	0	6	0	0	0	72	0	0	68
Lane Group Flow (vph)	84	2080	0	143	1827	0	0	34	55	147	145	42
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8	1	4	4	5
Permitted Phases									8			4
Actuated Green, G (s)	7.9	77.7		11.1	80.9			3.2	14.3	12.0	12.0	19.9
Effective Green, g (s)	7.9	77.7		11.1	80.9			3.2	14.3	12.0	12.0	19.9
Actuated g/C Ratio	0.07	0.65		0.09	0.67			0.03	0.12	0.10	0.10	0.17
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)	116	2200		163	2271			47	188	168	169	262
v/s Ratio Prot	0.05	c0.61		0.08	c0.54			c0.02	0.03	c0.09	0.09	0.01
v/s Ratio Perm									0.01			0.02
v/c Ratio	0.72	0.95		0.88	0.80			0.72	0.29	0.88	0.86	0.16
Uniform Delay, d1	55.0	19.2		53.8	13.9			58.0	48.2	53.3	53.2	42.9
Progression Factor	1.05	0.59		0.67	0.39			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.3	7.0		20.9	1.5			42.4	0.9	36.2	32.4	0.3
Delay (s)	70.8	18.3		56.8	6.9			100.4	49.1	89.4	85.6	43.2
Level of Service	E	B		E	A			F	D	F	F	D
Approach Delay (s)		20.4			10.5			59.9			75.4	
Approach LOS		C			B			E			E	

Intersection Summary				
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	90.3%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Redwood Drive & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	185	2260	36	38	1621	286	39	7	48	720	14	336
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	12	12	12	12	11	12
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	0.94		1.00	1.00	0.99
Flpb, ped/bikes	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		1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1711	4809		1770	3471	1566	1770	1514		1681	1632	1561
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	1711	4809		1770	3471	1566	1770	1514		1681	1632	1561
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	2260	36	38	1621	286	39	7	48	720	14	336
RTOR Reduction (vph)	0	1	0	0	0	75	0	47	0	0	0	53
Lane Group Flow (vph)	185	2295	0	38	1621	211	39	8	0	367	367	283
Confl. Peds. (#/hr)			4			2			2			4
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	4%	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6	7	8	8		7	7	5
Permitted Phases						6						7
Actuated Green, G (s)	14.8	69.4		3.2	57.8	86.0	3.2	3.2		28.2	28.2	43.0
Effective Green, g (s)	14.8	69.4		3.2	57.8	86.0	3.2	3.2		28.2	28.2	43.0
Actuated g/C Ratio	0.12	0.58		0.03	0.48	0.72	0.03	0.03		0.23	0.23	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
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)	211	2781		47	1671	1174	47	40		395	383	559
v/s Ratio Prot	0.11	c0.48		0.02	c0.47	0.04	c0.02	0.01		0.22	c0.22	0.06
v/s Ratio Perm						0.09						0.12
v/c Ratio	0.88	0.83		0.81	0.97	0.18	0.83	0.21		0.93	0.96	0.51
Uniform Delay, d1	51.7	20.4		58.1	30.3	5.5	58.1	57.2		44.9	45.3	30.2
Progression Factor	0.79	0.52		1.09	0.64	0.06	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.9	1.3		52.4	13.4	0.1	69.6	2.6		27.8	34.8	0.7
Delay (s)	56.8	11.9		115.6	32.7	0.4	127.8	59.7		72.7	80.1	30.9
Level of Service	E	B		F	C	A	F	E		E	F	C
Approach Delay (s)		15.2			29.5			88.0			62.1	
Approach LOS		B			C			F			E	

Intersection Summary				
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	92.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1935	1098	147	1392	0	0	0	0	585	1	574
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	0.95	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	0.98	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3406	1437	1770	3406					3433	1422	1421
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3406	1437	1770	3406					3433	1422	1421
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1935	1098	147	1392	0	0	0	0	585	1	574
RTOR Reduction (vph)	0	0	297	0	0	0	0	0	0	0	78	78
Lane Group Flow (vph)	0	1935	801	147	1392	0	0	0	0	585	210	209
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			5									5
Heavy Vehicles (%)	2%	6%	6%	2%	6%	6%	6%	6%	6%	2%	2%	6%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		71.0	71.0	16.0	91.0					21.0	21.0	21.0
Effective Green, g (s)		71.0	71.0	16.0	91.0					21.0	21.0	21.0
Actuated g/C Ratio		0.59	0.59	0.13	0.76					0.18	0.18	0.18
Clearance Time (s)		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
Lane Grp Cap (vph)		2015	850	236	2582					600	248	248
v/s Ratio Prot		c0.57		0.08	c0.41					c0.17	0.15	
v/s Ratio Perm			0.56									0.15
v/c Ratio		0.96	0.94	0.62	0.54					0.97	0.85	0.84
Uniform Delay, d1		23.2	22.6	49.1	5.9					49.2	47.9	47.9
Progression Factor		0.71	0.77	1.14	1.14					1.00	1.00	1.00
Incremental Delay, d2		7.9	12.3	4.9	0.7					30.2	22.3	21.9
Delay (s)		24.3	29.8	60.8	7.5					79.5	70.3	69.8
Level of Service		C	C	E	A					E	E	E
Approach Delay (s)		26.3			12.6			0.0			74.8	
Approach LOS		C			B			A			E	

Intersection Summary				
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	103.4%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2520	0	0	972	567	366
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.91	0.97	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3406			5085	3303	1544
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3406			5085	3303	1544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2520	0	0	972	567	366
RTOR Reduction (vph)	0	0	0	0	0	7
Lane Group Flow (vph)	2520	0	0	972	567	359
Confl. Peds. (#/hr)						5
Confl. Bikes (#/hr)						5
Heavy Vehicles (%)	6%	2%	2%	2%	6%	2%
Turn Type	NA			NA	NA	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	86.0			86.0	26.0	26.0
Effective Green, g (s)	86.0			86.0	26.0	26.0
Actuated g/C Ratio	0.72			0.72	0.22	0.22
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)	2440			3644	715	334
v/s Ratio Prot	c0.74			0.19	0.17	
v/s Ratio Perm						c0.23
v/c Ratio	1.03			0.27	0.79	1.07
Uniform Delay, d1	17.0			6.0	44.5	47.0
Progression Factor	0.41			0.02	1.00	1.00
Incremental Delay, d2	19.9			0.1	6.0	70.6
Delay (s)	26.8			0.2	50.5	117.6
Level of Service	C			A	D	F
Approach Delay (s)	26.8			0.2	76.8	
Approach LOS	C			A	E	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Old Redwood Highway #1/NB US 101 On-ramp & Commerce Boulevard

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	537	49	1357	847	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	11	12	12	12
Total Lost time (s)	4.0	4.0	4.5	4.0		
Lane Util. Factor	1.00	1.00	0.95	1.00		
Frt	1.00	0.85	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1888	1689	3355	1583		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1888	1689	3355	1583		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	537	49	1357	847	0	0
RTOR Reduction (vph)	0	23	0	0	0	0
Lane Group Flow (vph)	537	26	1357	847	0	0
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%
Turn Type	NA	Perm	NA	Free		
Protected Phases	7		6			
Permitted Phases		7		Free		
Actuated Green, G (s)	39.6	39.6	71.9	120.0		
Effective Green, g (s)	39.6	39.6	71.9	120.0		
Actuated g/C Ratio	0.33	0.33	0.60	1.00		
Clearance Time (s)	4.0	4.0	4.5			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	623	557	2010	1583		
v/s Ratio Prot	c0.28		c0.40			
v/s Ratio Perm		0.02		0.53		
v/c Ratio	0.86	0.05	0.68	0.54		
Uniform Delay, d1	37.6	27.4	16.2	0.0		
Progression Factor	1.00	1.00	0.46	1.00		
Incremental Delay, d2	11.8	0.0	0.2	0.1		
Delay (s)	49.4	27.4	7.6	0.1		
Level of Service	D	C	A	A		
Approach Delay (s)	47.6		4.7			0.0
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Old Redwood Highway #1 & Gravenstein Hwy #5/Gravenstein Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1382	109	1394	38	63	52	616	805	43	0	232	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	14	12
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	0.97	1.00	1.00	1.00	1.00		0.97	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.93		1.00	1.00			1.00	1.00
Flpb, ped/bikes	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	0.93		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	3367	1863	1548	1770	1608		3433	1840			1987	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	3367	1863	1548	1770	1608		3433	1840			1987	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1382	109	1394	38	63	52	616	805	43	0	232	291
RTOR Reduction (vph)	0	0	0	0	24	0	0	2	0	0	0	0
Lane Group Flow (vph)	1382	109	1394	38	91	0	616	846	0	0	232	291
Confl. Peds. (#/hr)			20			20			20			20
Confl. Bikes (#/hr)			20			20			20			20
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Free	Prot	NA		Prot	NA			NA	pt+ov
Protected Phases	5	2		1	6		3	8			4	4 5
Permitted Phases			Free									
Actuated Green, G (s)	47.4	51.4	120.0	3.6	7.6		23.6	53.0			25.4	76.8
Effective Green, g (s)	47.4	51.4	120.0	3.6	7.6		23.6	53.0			25.4	76.8
Actuated g/C Ratio	0.39	0.43	1.00	0.03	0.06		0.20	0.44			0.21	0.64
Clearance Time (s)	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	
Lane Grp Cap (vph)	1329	797	1548	53	101		675	812			420	1013
v/s Ratio Prot	c0.41	0.06		0.02	0.06		0.18	c0.46			0.12	0.18
v/s Ratio Perm			c0.90									
v/c Ratio	1.04	0.14	0.90	0.72	0.90		0.91	1.04			0.55	0.29
Uniform Delay, d1	36.3	20.8	0.0	57.7	55.8		47.2	33.5			42.2	9.5
Progression Factor	0.99	1.07	1.00	1.00	1.00		1.00	1.00			0.24	0.65
Incremental Delay, d2	20.7	0.0	0.9	36.9	57.3		16.7	43.1			1.1	0.1
Delay (s)	56.8	22.4	0.9	94.6	113.1		63.9	76.6			11.2	6.3
Level of Service	E	C	A	F	F		E	E			B	A
Approach Delay (s)		28.5			108.5			71.3			8.5	
Approach LOS		C			F			E			A	

Intersection Summary				
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.12			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	97.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
8: Old Redwood Highway #1 & William Street/George Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	2	28	11	1	42	15	1250	17	42	1438	69
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.92		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.96			0.99		0.99	1.00		1.00	1.00	
Frt		0.97			0.90		1.00	1.00		1.00	0.99	
Flt Protected		0.96			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1467			1361		1569	3172		1593	3141	
Flt Permitted		0.80			0.94		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1217			1298		1569	3172		1593	3141	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	2	28	11	1	42	15	1250	17	42	1438	69
RTOR Reduction (vph)	0	18	0	0	36	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	101	0	0	18	0	15	1266	0	42	1504	0
Confl. Peds. (#/hr)	60		60	60		60	60		60	60		60
Confl. Bikes (#/hr)			20			20			20			20
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		9.9			9.9		0.7	44.2		2.2	45.7	
Effective Green, g (s)		9.9			9.9		0.7	44.2		2.2	45.7	
Actuated g/C Ratio		0.14			0.14		0.01	0.65		0.03	0.67	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		176			188		16	2052		51	2101	
v/s Ratio Prot							0.01	0.40		c0.03	c0.48	
v/s Ratio Perm		c0.08			0.01							
v/c Ratio		0.57			0.10		0.94	0.62		0.82	0.72	
Uniform Delay, d1		27.2			25.3		33.8	7.1		32.9	7.2	
Progression Factor		1.02			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.5			0.2		191.7	0.6		64.6	1.2	
Delay (s)		32.4			25.5		225.5	7.6		97.5	8.4	
Level of Service		C			C		F	A		F	A	
Approach Delay (s)		32.4			25.5			10.2			10.8	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	68.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	70.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Old Redwood Highway #2/Old Redwood Highway #1 & West Sierra Avenue #4/East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	376	6	0	326	639	5	469	11	714	500	149
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	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.58		1.00	0.90	1.00	1.00		1.00	0.96	
Flpb, ped/bikes	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	0.85	1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	921		1863	1427	1770	3511		3433	1720	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	921		1863	1427	1770	3511		3433	1720	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	168	376	6	0	326	639	5	469	11	714	500	149
RTOR Reduction (vph)	0	0	4	0	0	43	0	1	0	0	9	0
Lane Group Flow (vph)	168	376	2	0	326	596	5	479	0	714	640	0
Confl. Peds. (#/hr)			120			120			120			120
Confl. Bikes (#/hr)			40			40			40			40
Turn Type	Prot	NA	Perm		NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	5	2			6	7	3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	13.0	38.6	38.6		21.6	49.2	0.8	29.5		27.6	56.3	
Effective Green, g (s)	13.0	38.6	38.6		21.6	49.2	0.8	29.5		27.6	56.3	
Actuated g/C Ratio	0.12	0.36	0.36		0.20	0.46	0.01	0.27		0.26	0.52	
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)	213	667	330		373	704	13	961		879	899	
v/s Ratio Prot	c0.09	0.20			0.18	c0.22	0.00	0.14		0.21	c0.37	
v/s Ratio Perm			0.00			0.20						
v/c Ratio	0.79	0.56	0.01		0.87	0.85	0.38	0.50		0.81	0.71	
Uniform Delay, d1	46.0	27.8	22.2		41.7	25.9	53.2	32.9		37.6	19.5	
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	1.1	0.0		19.7	9.3	17.9	0.4		5.8	2.7	
Delay (s)	63.4	28.9	22.2		61.4	35.2	71.1	33.3		43.4	22.2	
Level of Service	E	C	C		E	D	E	C		D	C	
Approach Delay (s)		39.4			44.0			33.7			33.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	107.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 AWSC
10: Old Redwood Highway #2 & Henry Street/Charles Street

Intersection	
Intersection Delay, s/veh	21.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	18	24	27	130	16	37	17	430	195	34	439	18
Peak Hour 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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	24	27	130	16	37	17	430	195	34	439	18
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	11.4	13.7	21.1	27.1
HCM LOS	B	B	C	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	0%	26%	71%	7%
Vol Thru, %	96%	0%	35%	9%	89%
Vol Right, %	0%	100%	39%	20%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	447	195	69	183	491
LT Vol	430	0	24	16	439
Through Vol	0	195	27	37	18
RT Vol	17	0	18	130	34
Lane Flow Rate	447	195	69	183	491
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.759	0.291	0.138	0.349	0.788
Departure Headway (Hd)	6.111	5.38	7.217	6.966	5.776
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	590	661	500	520	624
Service Time	3.894	3.162	5.217	4.966	3.856
HCM Lane V/C Ratio	0.758	0.295	0.138	0.352	0.787
HCM Control Delay	25.8	10.4	11.4	13.7	27.1
HCM Lane LOS	D	B	B	B	D
HCM 95th-tile Q	6.8	1.2	0.5	1.6	7.6

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
11: Old Redwood Highway/Old Redwood Highway #2 & Valparaiso Avenue/Myrtle Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	85	39	61	38	62	47	524	158	95	436	10
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
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1756		1770	1642		1770	1863	1540	1770	1863	1531
Flt Permitted	0.69	1.00		0.68	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1290	1756		1262	1642		1770	1863	1540	1770	1863	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	85	39	61	38	62	47	524	158	95	436	10
RTOR Reduction (vph)	0	19	0	0	52	0	0	0	76	0	0	4
Lane Group Flow (vph)	6	105	0	61	48	0	47	524	82	95	436	6
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	8.8	8.8		8.8	8.8		2.7	28.9	28.9	6.8	33.0	33.0
Effective Green, g (s)	8.8	8.8		8.8	8.8		2.7	28.9	28.9	6.8	33.0	33.0
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.05	0.51	0.51	0.12	0.58	0.58
Clearance 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)	200	273		196	255		84	952	787	213	1088	894
v/s Ratio Prot		c0.06			0.03		0.03	c0.28		c0.05	0.23	
v/s Ratio Perm	0.00			0.05					0.05			0.00
v/c Ratio	0.03	0.39		0.31	0.19		0.56	0.55	0.10	0.45	0.40	0.01
Uniform Delay, d1	20.2	21.4		21.2	20.7		26.3	9.4	7.1	23.1	6.4	4.9
Progression Factor	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	0.9		0.9	0.4		7.9	0.7	0.1	1.5	0.2	0.0
Delay (s)	20.3	22.3		22.1	21.1		34.2	10.1	7.2	24.6	6.6	4.9
Level of Service	C	C		C	C		C	B	A	C	A	A
Approach Delay (s)		22.2			21.5			11.0			9.7	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	56.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 AWSC
12: SB US 101 On-ramp/West School Road & West Sierra Avenue #4

Intersection	
Intersection Delay, s/veh	15.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	215	29	284	257	64	0	0	0	36	9	2
Peak Hour 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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	215	29	284	257	64	0	0	0	36	9	2
Number of Lanes	0	1	0	0	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	9.8	18.5	9.5
HCM LOS	A	C	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	47%	77%
Vol Thru, %	87%	42%	19%
Vol Right, %	12%	11%	4%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	247	605	47
LT Vol	215	257	9
Through Vol	29	64	2
RT Vol	3	284	36
Lane Flow Rate	247	605	47
Geometry Grp	1	1	1
Degree of Util (X)	0.317	0.734	0.077
Departure Headway (Hd)	4.62	4.365	5.898
Convergence, Y/N	Yes	Yes	Yes
Cap	778	829	605
Service Time	2.653	2.391	3.958
HCM Lane V/C Ratio	0.317	0.73	0.078
HCM Control Delay	9.8	18.5	9.5
HCM Lane LOS	A	C	A
HCM 95th-tile Q	1.4	6.7	0.2

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Unsignalized Intersection Capacity Analysis
13: NB US 101 Off-ramp & West Sierra Avenue #4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	251	0	0	530	74	459
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	251	0	0	530	74	459
Pedestrians	1			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			251		782	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			251		782	252
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		80	42
cM capacity (veh/h)			1314		363	786

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	251	530	74	459
Volume Left	0	0	74	0
Volume Right	0	0	0	459
cSH	1700	1700	363	786
Volume to Capacity	0.15	0.31	0.20	0.58
Queue Length 95th (ft)	0	0	19	96
Control Delay (s)	0.0	0.0	17.5	15.8
Lane LOS			C	C
Approach Delay (s)	0.0	0.0	16.0	
Approach LOS			C	

Intersection Summary			
Average Delay		6.5	
Intersection Capacity Utilization		48.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM 2010 AWSC
14: West Sierra Avenue #4 & East School Street

Intersection	
Intersection Delay, s/veh	19.6
Intersection LOS	C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	39	544	490	51	43	21
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	544	490	51	43	21
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	21.7	18.5	10.2
HCM LOS	C	C	B

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	0%	67%
Vol Thru, %	93%	91%	0%
Vol Right, %	0%	9%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	583	541	64
LT Vol	544	490	0
Through Vol	0	51	21
RT Vol	39	0	43
Lane Flow Rate	583	541	64
Geometry Grp	1	1	1
Degree of Util (X)	0.766	0.708	0.113
Departure Headway (Hd)	4.728	4.708	6.379
Convergence, Y/N	Yes	Yes	Yes
Cap	758	763	565
Service Time	2.794	2.775	4.379
HCM Lane V/C Ratio	0.769	0.709	0.113
HCM Control Delay	21.7	18.5	10.2
HCM Lane LOS	C	C	B
HCM 95th-tile Q	7.4	6	0.4

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM Signalized Intersection Capacity Analysis
15: Charles Street & East Cotati Avenue #3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1220	9	172	1017	6	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		3.0	4.0	3.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	0.93	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1673		1770	1863	1510	
Flt Permitted	1.00		0.07	1.00	1.00	
Satd. Flow (perm)	1673		133	1863	1510	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1220	9	172	1017	6	258
RTOR Reduction (vph)	0	0	0	0	147	0
Lane Group Flow (vph)	1229	0	172	1017	117	0
Confl. Peds. (#/hr)		30	10		11	10
Confl. Bikes (#/hr)		5				5
Parking (#/hr)	0					
Turn Type	NA		pm+pt	NA	NA	
Protected Phases	4		3	8	2	
Permitted Phases			8			
Actuated Green, G (s)	86.2		95.2	95.2	13.7	
Effective Green, g (s)	86.2		95.2	95.2	13.7	
Actuated g/C Ratio	0.74		0.82	0.82	0.12	
Clearance Time (s)	4.0		3.0	4.0	3.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1244		193	1530	178	
v/s Ratio Prot	c0.73		c0.05	0.55	c0.08	
v/s Ratio Perm			0.68			
v/c Ratio	0.99		0.89	0.66	0.66	
Uniform Delay, d1	14.3		32.7	4.1	48.8	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	22.3		36.2	1.1	8.4	
Delay (s)	36.7		68.9	5.2	57.3	
Level of Service	D		E	A	E	
Approach Delay (s)	36.7			14.4	57.3	
Approach LOS	D			B	E	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	115.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Lasalle Avenue & East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	1243	226	73	975	3	195	0	73	6	1	10
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	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	0.97		1.00	1.00			0.97			0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.96			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	
Satd. Flow (prot)	1770	3354		1770	3535			1681			1579	
Flt Permitted	0.95	1.00		0.95	1.00			0.77			0.92	
Satd. Flow (perm)	1770	3354		1770	3535			1349			1482	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	1243	226	73	975	3	195	0	73	6	1	10
RTOR Reduction (vph)	0	14	0	0	0	0	0	48	0	0	8	0
Lane Group Flow (vph)	3	1455	0	73	978	0	0	220	0	0	9	0
Confl. Peds. (#/hr)			60			60			60			60
Confl. Bikes (#/hr)			30			30			30			30
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	0.7	46.3		5.2	50.8			17.6			17.6	
Effective Green, g (s)	0.7	46.3		5.2	50.8			17.6			17.6	
Actuated g/C Ratio	0.01	0.57		0.06	0.63			0.22			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)	15	1914		113	2214			292			321	
v/s Ratio Prot	0.00	c0.43		c0.04	0.28							
v/s Ratio Perm								c0.16			0.01	
v/c Ratio	0.20	0.76		0.65	0.44			0.75			0.03	
Uniform Delay, d1	39.9	13.2		37.1	7.8			29.7			25.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	6.5	1.8		12.0	0.1			10.5			0.0	
Delay (s)	46.4	15.0		49.1	8.0			40.3			25.1	
Level of Service	D	B		D	A			D			C	
Approach Delay (s)		15.1			10.8			40.3			25.1	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	81.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: East Cotati Avenue #3 & Adrian Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	1136	21	35	910	86	20	1	20	119	0	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	10
Total Lost time (s)	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
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (prot)	1770	3530		1770	3475			1699			1770	1400
Flt Permitted	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (perm)	1770	3530		1770	3475			1699			1770	1400
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	165	1136	21	35	910	86	20	1	20	119	0	141
RTOR Reduction (vph)	0	1	0	0	5	0	0	19	0	0	0	123
Lane Group Flow (vph)	165	1156	0	35	991	0	0	22	0	0	119	18
Confl. Peds. (#/hr)	17					11				11		17
Confl. Bikes (#/hr)						10						10
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												4
Actuated Green, G (s)	13.1	61.6		2.4	50.9			7.1			12.9	12.9
Effective Green, g (s)	13.1	61.6		2.4	50.9			7.1			12.9	12.9
Actuated g/C Ratio	0.13	0.62		0.02	0.51			0.07			0.13	0.13
Clearance Time (s)	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
Lane Grp Cap (vph)	231	2174		42	1768			120			228	180
v/s Ratio Prot	c0.09	0.33		0.02	c0.29			c0.01			c0.07	
v/s Ratio Perm												0.01
v/c Ratio	0.71	0.53		0.83	0.56			0.19			0.52	0.10
Uniform Delay, d1	41.7	11.0		48.6	16.9			43.7			40.7	38.4
Progression Factor	1.00	1.00		0.76	0.49			1.00			1.00	1.00
Incremental Delay, d2	10.0	0.9		73.9	1.2			0.8			2.2	0.2
Delay (s)	51.7	11.9		110.8	9.5			44.5			42.8	38.7
Level of Service	D	B		F	A			D			D	D
Approach Delay (s)		16.9			12.9			44.5			40.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
18: Lancaster Drive & East Cotati Avenue #3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	1058	201	143	911	8	122	0	142	1	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	12	11	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00			1.00	0.93	1.00	0.93	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97	1.00	0.97	1.00	
Frt	1.00	0.98		1.00	1.00			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	3402		1770	3531			1712	1476	1654	1468	
Flt Permitted	0.95	1.00		0.95	1.00			0.75	1.00	0.57	1.00	
Satd. Flow (perm)	1770	3402		1770	3531			1360	1476	997	1468	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	1058	201	143	911	8	122	0	142	1	0	5
RTOR Reduction (vph)	0	14	0	0	0	0	0	0	122	0	4	0
Lane Group Flow (vph)	15	1245	0	143	919	0	0	122	20	1	1	0
Confl. Peds. (#/hr)	28		23	24		29	23		24	29		28
Confl. Bikes (#/hr)			15			15			15			15
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	11.7	58.8		14.9	62.0			14.3	14.3	14.3	14.3	
Effective Green, g (s)	11.7	58.8		14.9	62.0			14.3	14.3	14.3	14.3	
Actuated g/C Ratio	0.12	0.59		0.15	0.62			0.14	0.14	0.14	0.14	
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)	207	2000		263	2189			194	211	142	209	
v/s Ratio Prot	0.01	c0.37		c0.08	0.26						0.00	
v/s Ratio Perm								c0.09	0.01	0.00		
v/c Ratio	0.07	0.62		0.54	0.42			0.63	0.10	0.01	0.00	
Uniform Delay, d1	39.3	13.4		39.4	9.8			40.4	37.2	36.8	36.7	
Progression Factor	0.79	0.45		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.3		2.3	0.6			6.2	0.2	0.0	0.0	
Delay (s)	31.1	7.3		41.7	10.4			46.6	37.4	36.8	36.7	
Level of Service	C	A		D	B			D	D	D	D	
Approach Delay (s)		7.6			14.6			41.7			36.8	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
19: Santero Way & East Cotati Avenue #3/East Cotati Avenue

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1010	139	50	870	266	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3458		1770	3539	1770	1537
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3458		1770	3539	1770	1537
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1010	139	50	870	266	47
RTOR Reduction (vph)	12	0	0	0	0	35
Lane Group Flow (vph)	1137	0	50	870	266	12
Confl. Peds. (#/hr)		5	5		5	5
Confl. Bikes (#/hr)		15				15
Turn Type	NA		Prot	NA	NA	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	28.9		3.0	35.9	15.2	15.2
Effective Green, g (s)	28.9		3.0	35.9	15.2	15.2
Actuated g/C Ratio	0.49		0.05	0.61	0.26	0.26
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1690		89	2149	455	395
v/s Ratio Prot	c0.33		0.03	c0.25	c0.15	
v/s Ratio Perm						0.01
v/c Ratio	0.67		0.56	0.40	0.58	0.03
Uniform Delay, d1	11.5		27.4	6.0	19.2	16.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1		7.9	0.1	1.9	0.0
Delay (s)	12.6		35.3	6.2	21.1	16.5
Level of Service	B		D	A	C	B
Approach Delay (s)	12.6			7.7	20.4	
Approach LOS	B			A	C	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
20: Madrone Avenue & Gravenstein Highway/Gravenstein Hwy #5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	872	42	119	1331	297	40	24	110	380	36	112
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	0.95	0.95	1.00
Frt	1.00	0.99		1.00	0.97			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	3388		1770	3335			1806	1583	1681	1699	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1770	3388		1770	3335			1806	1583	1681	1699	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	872	42	119	1331	297	40	24	110	380	36	112
RTOR Reduction (vph)	0	4	0	0	15	0	0	0	66	0	0	64
Lane Group Flow (vph)	83	910	0	119	1613	0	0	64	44	209	207	48
Heavy Vehicles (%)	2%	6%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8	1	4	4	5
Permitted Phases									8			4
Actuated Green, G (s)	8.6	43.8		36.1	71.3			5.9	42.0	18.2	18.2	26.8
Effective Green, g (s)	8.6	43.8		36.1	71.3			5.9	42.0	18.2	18.2	26.8
Actuated g/C Ratio	0.07	0.36		0.30	0.59			0.05	0.35	0.15	0.15	0.22
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)	126	1236		532	1981			88	554	254	257	406
v/s Ratio Prot	c0.05	0.27		0.07	c0.48			c0.04	0.02	c0.12	0.12	0.01
v/s Ratio Perm									0.00			0.02
v/c Ratio	0.66	0.74		0.22	0.81			0.73	0.08	0.82	0.81	0.12
Uniform Delay, d1	54.3	33.1		31.4	19.1			56.3	26.1	49.3	49.2	37.2
Progression Factor	1.00	1.00		0.74	0.25			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.8	2.3		0.1	2.4			25.6	0.1	18.9	16.6	0.1
Delay (s)	66.1	35.4		23.4	7.2			81.9	26.1	68.3	65.8	37.3
Level of Service	E	D		C	A			F	C	E	E	D
Approach Delay (s)		38.0			8.3			46.6			60.7	
Approach LOS		D			A			D			E	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

ROADWAY SEGMENT TRAVEL SPEED CALCULATIONS

Arterial Level of Service: EB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Alder Ave	1	1.8	24.6	0.3	49
West Cotati Avenue	2	0.6	8.4	0.1	42
	145	1.0	13.4	0.2	43
	3	9.8	17.4	0.1	16
SB US 101 On-ramp	4	13.4	22.2	0.1	15
NB US 101 Off-ramp	5	6.7	15.1	0.1	21
Old Redwood Highway	7	11.8	18.7	0.1	17
Total		45.2	119.9	0.9	28

Arterial Level of Service: WB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	5	6.1	13.2	0.1	24
SB US 101 Off-ramp	4	6.1	14.7	0.1	21
Redwood Drive	3	15.1	23.7	0.1	14
	145	2.7	10.5	0.1	27
West Cotati Avenue	2	1.5	14.8	0.2	39
Alder Avenue	1	0.9	8.8	0.1	41
	20	1.3	25.1	0.3	48
Total		33.7	110.9	0.9	31

Arterial Level of Service: NB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	29	1.9	12.7	0.1	23
George Street	8	8.0	19.6	0.1	15
St. Joseph Way	70	2.7	25.5	0.2	29
Gravenstein Way	7	14.1	19.5	0.1	10
Commerce Boulevard	6	6.8	19.9	0.1	19
Total		33.5	97.2	0.5	20

Arterial Level of Service: SB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Gravenstein Hwy #5	7	-	-	0.1	-
St. Joseph Way	70	0.9	4.2	0.1	50
William Street	8	5.1	24.1	0.2	31
La Plaza	29	1.8	13.5	0.1	22
West Sierra Avenue #	9	14.3	24.9	0.1	12
Total		22.1	66.7	0.5	29

Arterial Level of Service: NB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	0.9	27.0	0.2	25
Total		0.9	27.0	0.2	25

Arterial Level of Service: WB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	0.3	7.9	0.1	27
NB US 101 On-ramp	6	11.3	37.8	0.2	18
Total		11.6	45.7	0.2	19

Arterial Level of Service: NB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	81	1.3	7.8	0.1	25
Charles Street	10	11.2	43.1	0.3	24
La Plaza	34	2.1	13.9	0.1	22
East Cotati Avenue #	9	24.7	30.3	0.0	5
Total		39.3	95.0	0.5	18

Arterial Level of Service: SB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	34	1.6	8.4	0.0	20
Henry Street	10	10.6	22.0	0.1	14
	81	2.8	34.9	0.3	29
Valparaiso Avenue	11	9.8	16.3	0.1	12
Total		24.8	81.6	0.5	21

Arterial Level of Service: EB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	13	0.5	8.1	0.1	28
Valparaiso Avenue	38	0.9	29.7	0.3	34
East School Street	14	6.3	16.1	0.1	20
Henry Street	37	2.9	13.9	0.1	24
La Plaza	32	0.3	13.5	0.1	25
Old Redwood Highway	9	12.9	19.2	0.1	9
Total		23.8	100.5	0.7	24

Arterial Level of Service: WB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	32	1.5	8.9	0.1	20
Olaf Street	37	1.3	14.3	0.1	24
East School Street	14	9.2	20.6	0.1	16
Valparaiso Avenue	38	2.3	11.1	0.1	29
NB US 101 Off-ramp	13	1.4	31.8	0.3	31
West School Road	12	2.5	9.9	0.1	23
Total		18.3	96.7	0.7	25

Arterial Level of Service: EB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	33	1.0	8.2	0.1	23
Charles Street	15	1.1	11.6	0.1	28
	77	1.4	23.7	0.2	29
Lasalle Avenue	16	7.2	17.1	0.1	18
Shopping Ctr	48	1.4	11.2	0.1	38
Adrian Drive	17	1.8	9.0	0.1	32
Lancaster Drive	18	9.9	18.3	0.1	15
Beverly Drive	39	1.7	13.8	0.1	27
Santero Way	19	0.6	14.1	0.1	30
Total		26.1	127.0	0.9	26

Arterial Level of Service: WB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Beverly Drive	39	0.4	13.9	0.1	30
Lancaster Drive	18	6.4	18.2	0.1	20
Adrian Drive	17	8.5	17.1	0.1	16
Shopping Ctr	48	2.4	11.3	0.1	25
Lasalle Avenue	16	19.1	31.4	0.1	14
	77	3.0	12.8	0.1	24
Charles Street	15	1.8	23.9	0.2	29
La Plaza	33	1.8	12.4	0.1	27
Old Redwood Highway	9	17.7	24.4	0.1	8
Total		61.1	165.4	0.9	20

Arterial Level of Service: EB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Alder Ave	1	2.1	26.8	0.3	45
West Cotati Avenue	2	1.1	9.0	0.1	40
	145	1.6	14.3	0.2	41
	3	26.7	34.5	0.1	8
SB US 101 On-ramp	4	6.6	15.0	0.1	22
NB US 101 Off-ramp	5	6.0	14.4	0.1	22
Old Redwood Highway	7	12.9	20.4	0.1	15
Total		57.1	134.5	0.9	25

Arterial Level of Service: WB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	5	2.7	10.1	0.1	31
SB US 101 Off-ramp	4	9.6	18.2	0.1	17
Redwood Drive	3	22.9	31.3	0.1	11
	145	3.3	11.1	0.1	25
West Cotati Avenue	2	2.7	16.0	0.2	36
Alder Avenue	1	1.5	9.6	0.1	37
Madrone Avenue	20	1.9	25.3	0.3	47
Total		44.7	121.6	0.9	28

Arterial Level of Service: NB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	29	2.0	12.8	0.1	23
George Street	8	11.3	22.9	0.1	13
St. Joseph Way	70	5.8	30.2	0.2	25
Gravenstein Way	7	32.4	38.0	0.1	5
Commerce Boulevard	6	7.5	19.7	0.1	19
Total		59.1	123.7	0.5	15

Arterial Level of Service: SB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Gravenstein Hwy #5	7	-	-	0.1	-
St. Joseph Way	70	2.2	8.4	0.1	23
William Street	8	17.0	40.5	0.2	18
La Plaza	29	2.3	13.9	0.1	21
West Sierra Avenue #	9	12.5	23.2	0.1	13
Total		34.0	86.0	0.5	22

Arterial Level of Service: NB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	1.7	28.1	0.2	24
Total		1.7	28.1	0.2	24

Arterial Level of Service: WB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	0.4	8.3	0.1	26
NB US 101 On-ramp	6	9.7	35.9	0.2	19
Total		10.1	44.2	0.2	20

Arterial Level of Service: NB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	81	1.7	8.1	0.1	24
Charles Street	10	18.0	49.1	0.3	21
La Plaza	34	2.5	13.9	0.1	22
East Cotati Avenue #	9	27.1	32.7	0.0	5
Total		49.3	103.9	0.5	16

Arterial Level of Service: SB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	34	1.9	8.7	0.0	19
Henry Street	10	14.7	26.0	0.1	12
	81	2.9	35.1	0.3	29
Valparaiso Avenue	11	6.1	12.3	0.1	16
Total		25.6	82.1	0.5	20

Arterial Level of Service: EB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	13	0.6	7.8	0.1	29
Valparaiso Avenue	38	1.1	28.6	0.3	35
East School Street	14	7.6	17.9	0.1	18
Henry Street	37	2.6	13.5	0.1	25
La Plaza	32	0.6	13.6	0.1	25
Old Redwood Highway	9	22.1	28.4	0.1	6
Total		34.5	109.8	0.7	22

Arterial Level of Service: WB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	32	1.6	9.1	0.1	20
Olaf Street	37	0.8	13.5	0.1	25
East School Street	14	7.9	19.2	0.1	18
Valparaiso Avenue	38	2.8	12.8	0.1	25
NB US 101 Off-ramp	13	0.6	28.4	0.3	35
West School Road	12	0.9	7.9	0.1	29
Total		14.5	90.9	0.7	26

Arterial Level of Service: EB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	33	1.5	8.8	0.1	21
Charles Street	15	2.4	12.9	0.1	26
	77	1.9	24.2	0.2	28
Lasalle Avenue	16	12.7	23.1	0.1	13
Shopping Ctr	48	2.7	16.3	0.1	26
Adrian Drive	17	4.9	14.1	0.1	20
Lancaster Drive	18	11.2	19.9	0.1	13
Beverly Drive	39	2.1	14.4	0.1	26
Santero Way	19	0.8	14.5	0.1	29
Total		40.3	148.1	0.9	22

Arterial Level of Service: WB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Beverly Drive	39	0.6	13.9	0.1	30
Lancaster Drive	18	5.8	17.6	0.1	21
Adrian Drive	17	12.3	21.0	0.1	13
Shopping Ctr	48	2.7	12.2	0.1	23
Lasalle Avenue	16	15.4	28.7	0.1	15
	77	2.9	12.7	0.1	24
Charles Street	15	1.6	24.1	0.2	28
La Plaza	33	2.5	13.1	0.1	25
Old Redwood Highway	9	26.6	33.1	0.1	6
Total		70.2	176.4	0.9	19

Arterial Level of Service: EB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Alder Ave	1	2.3	26.1	0.3	46
West Cotati Avenue	2	1.0	8.8	0.1	41
	145	1.9	14.3	0.2	41
	3	25.7	33.9	0.1	8
SB US 101 On-ramp	4	24.5	33.1	0.1	10
NB US 101 Off-ramp	5	3.4	11.5	0.1	27
Old Redwood Highway	7	12.0	19.7	0.1	16
Total		70.8	147.4	0.9	23

Arterial Level of Service: WB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	5	5.9	11.7	0.1	27
SB US 101 Off-ramp	4	7.7	16.8	0.1	19
Redwood Drive	3	33.7	42.0	0.1	8
	145	3.2	10.7	0.1	26
West Cotati Avenue	2	1.7	14.5	0.2	40
Alder Avenue	1	1.2	9.3	0.1	38
	20	2.4	28.3	0.3	42
Total		55.7	133.4	0.9	25

Arterial Level of Service: NB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	29	2.1	13.1	0.1	22
George Street	8	6.6	18.6	0.1	16
St. Joseph Way	70	2.8	27.1	0.2	28
Gravenstein Way	7	17.6	23.2	0.1	9
Commerce Boulevard	6	6.9	20.7	0.1	18
Total		36.1	102.6	0.5	19

Arterial Level of Service: SB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Gravenstein Hwy #5	7	25.0	38.1	0.1	10
St. Joseph Way	70	2.2	8.0	0.1	25
William Street	8	8.8	32.5	0.2	23
La Plaza	29	1.9	13.1	0.1	23
West Sierra Avenue #	9	9.8	21.0	0.1	14
Total		47.7	112.8	0.5	17

Arterial Level of Service: NB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	1.2	26.2	0.2	26
Total		1.2	26.2	0.2	26

Arterial Level of Service: WB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	0.3	8.3	0.1	26
NB US 101 On-ramp	6	20.8	49.2	0.2	14
Total		21.1	57.6	0.2	15

Arterial Level of Service: NB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	81	1.3	7.7	0.1	26
Charles Street	10	10.0	40.5	0.3	25
La Plaza	34	2.0	13.6	0.1	22
East Cotati Avenue #	9	20.5	25.5	0.0	6
Total		34.0	87.4	0.5	19

Arterial Level of Service: SB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	34	0.9	7.9	0.0	21
Henry Street	10	12.5	23.7	0.1	13
	81	2.5	31.4	0.3	32
Valparaiso Avenue	11	6.1	12.1	0.1	16
Total		22.1	75.1	0.5	22

Arterial Level of Service: EB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	13	0.7	8.4	0.1	27
Valparaiso Avenue	38	1.4	28.2	0.3	35
East School Street	14	8.0	17.9	0.1	18
Henry Street	37	2.9	13.7	0.1	24
La Plaza	32	0.4	12.6	0.1	27
Old Redwood Highway	9	21.0	27.3	0.1	7
Total		34.3	108.0	0.7	22

Arterial Level of Service: WB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	32	1.4	9.0	0.1	20
Olaf Street	37	1.0	13.9	0.1	24
East School Street	14	8.3	19.6	0.1	17
Valparaiso Avenue	38	2.9	13.3	0.1	24
NB US 101 Off-ramp	13	1.4	32.1	0.3	31
West School Road	12	1.9	9.4	0.1	24
Total		16.9	97.3	0.7	25

Arterial Level of Service: EB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	33	1.6	8.9	0.1	21
Charles Street	15	2.9	13.6	0.1	24
	77	2.2	24.4	0.2	28
Lasalle Avenue	16	9.4	19.6	0.1	16
Shopping Ctr	48	2.2	14.2	0.1	30
Adrian Drive	17	1.6	8.8	0.1	32
Lancaster Drive	18	14.3	23.1	0.1	12
Beverly Drive	39	2.0	14.2	0.1	26
Santero Way	19	0.4	13.6	0.1	31
Total		36.6	140.4	0.9	23

Arterial Level of Service: WB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Beverly Drive	39	0.7	14.1	0.1	30
Lancaster Drive	18	6.3	17.8	0.1	21
Adrian Drive	17	8.7	17.1	0.1	16
Shopping Ctr	48	2.4	11.3	0.1	25
Lasalle Avenue	16	26.4	38.7	0.1	11
	77	3.0	12.9	0.1	24
Charles Street	15	2.0	23.6	0.2	29
La Plaza	33	1.5	12.2	0.1	27
Old Redwood Highway	9	18.5	25.1	0.1	7
Total		69.6	172.8	0.9	19

Arterial Level of Service: EB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Alder Ave	1	3.7	28.7	0.3	42
West Cotati Avenue	2	1.5	9.5	0.1	38
	145	2.8	15.3	0.2	38
	3	30.4	38.0	0.1	7
SB US 101 On-ramp	4	5.1	14.2	0.1	24
NB US 101 Off-ramp	5	5.3	14.1	0.1	22
Old Redwood Highway	7	9.7	17.1	0.1	18
Total		58.5	136.9	0.9	25

Arterial Level of Service: WB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	5	3.8	11.4	0.1	28
SB US 101 Off-ramp	4	16.3	25.1	0.1	13
Redwood Drive	3	54.8	63.4	0.1	5
	145	5.3	13.0	0.1	22
West Cotati Avenue	2	5.3	18.1	0.2	32
Alder Avenue	1	2.2	10.1	0.1	36
Madrone Avenue	20	2.3	26.1	0.3	46
Total		89.9	167.0	0.9	20

Arterial Level of Service: NB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	29	1.9	12.7	0.1	23
George Street	8	10.8	22.5	0.1	13
St. Joseph Way	70	8.4	32.9	0.2	23
Gravenstein Way	7	35.0	40.7	0.1	5
Commerce Boulevard	6	7.8	20.9	0.1	18
Total		63.9	129.7	0.5	15

Arterial Level of Service: SB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Gravenstein Hwy #5	7	-	-	0.1	-
St. Joseph Way	70	2.5	8.8	0.1	23
William Street	8	13.8	37.9	0.2	20
La Plaza	29	2.1	13.7	0.1	22
West Sierra Avenue #	9	11.6	22.3	0.1	13
Total		30.0	82.7	0.5	23

Arterial Level of Service: NB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	1.8	28.7	0.2	23
Total		1.8	28.7	0.2	23

Arterial Level of Service: WB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	0.5	8.4	0.1	26
NB US 101 On-ramp	6	10.0	36.1	0.2	19
Total		10.5	44.5	0.2	20

Arterial Level of Service: NB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	81	1.4	7.9	0.1	25
Charles Street	10	13.7	43.5	0.3	23
La Plaza	34	2.1	13.5	0.1	22
East Cotati Avenue #	9	29.3	34.9	0.0	5
Total		46.4	99.8	0.5	17

Arterial Level of Service: SB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	34	1.4	8.1	0.0	20
Henry Street	10	11.9	23.0	0.1	13
	81	2.7	34.5	0.3	29
Valparaiso Avenue	11	5.7	11.9	0.1	17
Total		21.7	77.4	0.5	22

Arterial Level of Service: EB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	13	0.7	8.2	0.1	28
Valparaiso Avenue	38	1.4	28.1	0.3	36
East School Street	14	7.6	17.7	0.1	18
Henry Street	37	2.7	14.1	0.1	24
La Plaza	32	0.4	13.7	0.1	25
Old Redwood Highway	9	19.7	26.2	0.1	7
Total		32.6	107.9	0.7	22

Arterial Level of Service: WB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	32	1.7	9.2	0.1	20
Olaf Street	37	1.0	13.9	0.1	24
East School Street	14	8.7	20.4	0.1	16
Valparaiso Avenue	38	2.8	13.2	0.1	24
NB US 101 Off-ramp	13	0.9	33.1	0.3	30
West School Road	12	1.5	8.9	0.1	26
Total		16.7	98.6	0.7	24

Arterial Level of Service: EB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	33	1.4	8.7	0.1	21
Charles Street	15	2.3	12.8	0.1	26
	77	2.0	24.3	0.2	28
Lasalle Avenue	16	12.9	23.1	0.1	13
Shopping Ctr	48	2.8	16.4	0.1	26
Adrian Drive	17	3.4	12.6	0.1	22
Lancaster Drive	18	13.5	22.1	0.1	12
Beverly Drive	39	2.2	14.4	0.1	26
Santero Way	19	1.0	14.4	0.1	29
Total		41.4	148.9	0.9	22

Arterial Level of Service: WB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Beverly Drive	39	0.7	14.0	0.1	30
Lancaster Drive	18	5.8	17.6	0.1	21
Adrian Drive	17	8.7	17.2	0.1	16
Shopping Ctr	48	1.7	10.7	0.1	27
Lasalle Avenue	16	16.1	29.3	0.1	15
	77	3.0	12.8	0.1	24
Charles Street	15	1.3	23.3	0.2	29
La Plaza	33	1.5	12.2	0.1	27
Old Redwood Highway	9	24.7	31.2	0.1	6
Total		63.3	168.4	0.9	19

Arterial Level of Service: EB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
New N-S Street	1	5.9	27.3	0.2	32
West Cotati Avenue	2	9.3	30.2	0.2	25
Redwood Drive	3	29.7	50.7	0.2	16
SB US 101 On-ramp	4	46.3	56.0	0.1	6
NB US 101 Off-ramp	5	8.0	16.7	0.1	19
Old Redwood Highway	7	17.3	23.9	0.1	13
Total		116.6	204.9	0.9	17

Arterial Level of Service: WB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	5	1.8	7.4	0.1	43
SB US 101 Off-ramp	4	22.7	31.2	0.1	10
Redwood Drive	3	15.3	23.9	0.1	14
West Cotati Avenue	2	9.2	30.3	0.2	26
New N-S Street	1	6.9	27.5	0.2	27
Madrone Avenue	20	5.2	27.0	0.2	32
Total		61.0	147.3	0.9	23

Arterial Level of Service: NB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	29	1.7	12.8	0.1	23
George Street	8	8.8	20.7	0.1	14
Gravenstein Way	7	26.6	56.5	0.3	17
Commerce Boulevard	6	6.5	19.6	0.1	19
Total		43.5	109.6	0.5	17

Arterial Level of Service: SB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Gravenstein Hwy #5	7	29.3	35.4	0.1	11
William Street	8	10.7	36.0	0.3	26
La Plaza	29	2.1	13.5	0.1	22
West Sierra Avenue #	9	16.7	27.5	0.1	11
Total		58.8	112.4	0.5	17

Arterial Level of Service: NB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	1.5	27.2	0.2	25
Total		1.5	27.2	0.2	25

Arterial Level of Service: WB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	0.4	8.1	0.1	27
NB US 101 On-ramp	6	31.6	57.1	0.2	12
Total		32.0	65.2	0.2	14

Arterial Level of Service: NB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	81	1.6	8.1	0.1	24
Charles Street	10	19.2	51.9	0.3	20
La Plaza	34	2.2	14.0	0.1	22
East Cotati Avenue #	9	21.7	27.4	0.0	6
Total		44.7	101.4	0.5	17

Arterial Level of Service: SB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	34	2.0	8.7	0.0	19
Henry Street	10	15.2	26.6	0.1	11
	81	3.2	35.5	0.3	29
Valparaiso Avenue	11	9.3	15.5	0.1	13
Total		29.7	86.3	0.5	19

Arterial Level of Service: EB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	13	1.0	8.6	0.1	27
Valparaiso Avenue	38	2.0	31.8	0.3	31
East School Street	14	9.2	19.4	0.1	16
Henry Street	37	3.2	14.2	0.1	24
La Plaza	32	2.9	15.9	0.1	21
Old Redwood Highway	9	18.6	24.9	0.1	7
Total		36.9	114.8	0.7	21

Arterial Level of Service: WB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	32	2.9	10.4	0.1	17
Olaf Street	37	1.2	14.1	0.1	24
East School Street	14	11.9	23.6	0.1	14
Valparaiso Avenue	38	3.1	13.1	0.1	24
NB US 101 Off-ramp	13	1.5	30.7	0.3	33
West School Road	12	3.4	10.8	0.1	21
Total		24.1	102.8	0.7	23

Arterial Level of Service: EB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	33	1.6	8.8	0.1	21
	48	6.2	12.7	0.0	13
Charles Street	15	8.9	14.8	0.0	11
	77	2.5	25.5	0.2	27
Lasalle Avenue	16	13.2	23.4	0.1	13
	17	16.1	37.6	0.2	19
Lancaster Drive	18	10.1	18.9	0.1	14
Beverly Drive	39	1.9	14.1	0.1	26
Santero Way	19	6.2	19.4	0.1	22
Total		66.7	175.1	0.9	19

Arterial Level of Service: WB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Beverly Drive	39	1.7	15.6	0.1	27
Lancaster Drive	18	7.5	19.6	0.1	19
Adrian Drive	17	14.9	23.7	0.1	11
Lasalle Avenue	16	16.1	38.1	0.2	19
	77	8.4	18.2	0.1	17
Charles Street	15	13.0	39.2	0.2	17
	48	4.5	10.1	0.0	16
La Plaza	33	7.9	13.3	0.0	12
Old Redwood Highway	9	41.4	47.7	0.1	4
Total		115.3	225.5	0.9	15

Arterial Level of Service: EB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
New N-S Street	1	14.2	34.5	0.2	25
West Cotati Avenue	2	22.6	42.6	0.2	18
Redwood Drive	3	54.9	75.2	0.2	11
SB US 101 On-ramp	4	25.8	35.5	0.1	10
NB US 101 Off-ramp	5	18.3	27.7	0.1	12
Old Redwood Highway	7	17.4	24.2	0.1	13
Total		153.2	239.8	0.9	14

Arterial Level of Service: WB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	5	9.6	16.8	0.1	19
SB US 101 Off-ramp	4	11.8	20.7	0.1	15
Redwood Drive	3	37.5	46.6	0.1	7
West Cotati Avenue	2	17.1	38.5	0.2	21
New N-S Street	1	14.0	34.3	0.2	22
Madrone Avenue	20	30.8	51.5	0.2	17
Total		120.8	208.3	0.9	16

Arterial Level of Service: NB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	29	1.9	12.9	0.1	23
George Street	8	11.9	23.6	0.1	13
Gravenstein Way	7	57.4	87.0	0.3	11
Commerce Boulevard	6	13.3	26.2	0.1	15
Total		84.5	149.7	0.5	13

Arterial Level of Service: SB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Gravenstein Hwy #5	7	2.7	3.5	0.1	110
William Street	8	10.6	37.2	0.3	25
La Plaza	29	3.0	14.7	0.1	20
West Sierra Avenue #	9	19.4	30.2	0.1	10
Total		35.7	85.7	0.5	22

Arterial Level of Service: NB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	1.9	29.2	0.2	23
Total		1.9	29.2	0.2	23

Arterial Level of Service: WB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	0.5	8.4	0.1	26
NB US 101 On-ramp	6	40.3	65.9	0.2	10
Total		40.8	74.3	0.2	12

Arterial Level of Service: NB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	81	1.6	8.1	0.1	24
Charles Street	10	27.9	59.0	0.3	17
La Plaza	34	2.3	13.7	0.1	22
East Cotati Avenue #	9	30.7	36.3	0.0	5
Total		62.5	117.1	0.5	14

Arterial Level of Service: SB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	34	2.8	9.5	0.0	18
Henry Street	10	26.3	37.3	0.1	8
	81	3.0	36.2	0.3	28
Valparaiso Avenue	11	7.5	13.6	0.1	15
Total		39.7	96.6	0.5	17

Arterial Level of Service: EB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	13	1.0	8.6	0.1	27
Valparaiso Avenue	38	2.0	29.7	0.3	34
East School Street	14	10.5	20.7	0.1	15
Henry Street	37	3.4	14.7	0.1	23
La Plaza	32	1.0	14.3	0.1	24
Old Redwood Highway	9	25.7	32.0	0.1	6
Total		43.6	120.1	0.7	20

Arterial Level of Service: WB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	32	1.9	9.5	0.1	19
Olaf Street	37	1.7	14.7	0.1	23
East School Street	14	13.4	25.1	0.1	13
Valparaiso Avenue	38	3.3	13.6	0.1	23
NB US 101 Off-ramp	13	1.4	32.5	0.3	31
West School Road	12	3.1	10.4	0.1	22
Total		24.7	105.9	0.7	23

Arterial Level of Service: EB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	33	1.7	9.1	0.1	21
	48	6.3	12.7	0.0	13
Charles Street	15	9.1	15.2	0.0	11
	77	2.8	25.8	0.2	26
Lasalle Avenue	16	14.1	24.6	0.1	13
	17	17.9	40.4	0.2	18
Lancaster Drive	18	11.0	19.9	0.1	13
Beverly Drive	39	2.0	14.3	0.1	26
Santero Way	19	10.0	23.7	0.1	18
Total		75.0	185.8	0.9	18

Arterial Level of Service: WB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Beverly Drive	39	1.9	15.5	0.1	27
Lancaster Drive	18	8.7	20.6	0.1	18
Adrian Drive	17	15.2	23.9	0.1	11
Lasalle Avenue	16	14.3	37.1	0.2	19
	77	7.7	17.6	0.1	18
Charles Street	15	11.6	38.5	0.2	18
	48	4.3	10.0	0.0	17
La Plaza	33	8.9	14.4	0.0	12
Old Redwood Highway	9	43.8	50.2	0.1	4
Total		116.4	227.8	0.9	14

Arterial Level of Service: EB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
New N-S Street	1	13.2	34.0	0.2	26
West Cotati Avenue	2	7.7	28.0	0.2	27
Redwood Drive	3	11.2	32.3	0.2	25
SB US 101 On-ramp	4	26.5	35.5	0.1	10
NB US 101 Off-ramp	5	8.6	17.7	0.1	18
Old Redwood Highway	7	16.3	23.0	0.1	14
Total		83.5	170.4	0.9	20

Arterial Level of Service: WB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	5	14.7	21.3	0.1	15
SB US 101 Off-ramp	4	22.1	30.8	0.1	10
Redwood Drive	3	18.1	27.1	0.1	13
West Cotati Avenue	2	16.4	38.2	0.2	21
New N-S Street	1	17.5	38.0	0.2	20
Madrone Avenue	20	6.5	28.0	0.2	31
Total		95.3	183.4	0.9	19

Arterial Level of Service: NB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	29	1.7	12.7	0.1	23
George Street	8	9.0	20.7	0.1	14
Gravenstein Way	7	24.2	53.3	0.3	18
Commerce Boulevard	6	5.8	19.3	0.1	20
Total		40.7	106.0	0.5	18

Arterial Level of Service: SB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Gravenstein Hwy #5	7	29.9	34.3	0.1	11
William Street	8	9.5	37.3	0.3	25
La Plaza	29	2.6	14.2	0.1	21
West Sierra Avenue #	9	16.3	27.3	0.1	11
Total		58.3	113.2	0.5	17

Arterial Level of Service: NB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	1.4	26.8	0.2	25
Total		1.4	26.8	0.2	25

Arterial Level of Service: WB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	0.4	8.2	0.1	26
NB US 101 On-ramp	6	17.2	42.7	0.2	16
Total		17.6	50.9	0.2	17

Arterial Level of Service: NB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	81	1.5	8.0	0.1	25
Charles Street	10	22.0	54.2	0.3	19
La Plaza	34	2.2	13.8	0.1	22
East Cotati Avenue #	9	23.2	28.8	0.0	6
Total		49.0	104.8	0.5	16

Arterial Level of Service: SB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	34	2.2	8.8	0.0	19
Henry Street	10	16.9	28.0	0.1	11
	81	3.2	36.5	0.3	28
Valparaiso Avenue	11	10.1	16.4	0.1	12
Total		32.5	89.6	0.5	19

Arterial Level of Service: EB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	13	1.2	8.7	0.1	26
Valparaiso Avenue	38	2.1	31.4	0.3	32
East School Street	14	9.7	19.8	0.1	16
Henry Street	37	3.4	14.5	0.1	23
La Plaza	32	0.5	13.5	0.1	25
Old Redwood Highway	9	20.0	26.3	0.1	7
Total		36.8	114.1	0.7	21

Arterial Level of Service: WB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	32	1.8	9.4	0.1	19
Olaf Street	37	1.3	14.3	0.1	24
East School Street	14	11.6	23.0	0.1	15
Valparaiso Avenue	38	3.2	13.3	0.1	24
NB US 101 Off-ramp	13	1.6	30.7	0.3	33
West School Road	12	3.6	11.0	0.1	21
Total		23.1	101.8	0.7	24

Arterial Level of Service: EB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	33	1.4	8.7	0.1	22
	69	4.8	11.3	0.0	15
Charles Street	15	7.5	13.3	0.0	12
	77	2.5	25.5	0.2	27
Lasalle Avenue	16	12.5	22.8	0.1	14
	17	17.0	38.4	0.2	19
Lancaster Drive	18	11.8	20.6	0.1	13
Beverly Drive	39	1.8	13.7	0.1	27
Santero Way	19	6.2	19.6	0.1	22
Total		65.4	173.7	0.9	19

Arterial Level of Service: WB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Beverly Drive	39	1.8	15.7	0.1	27
Lancaster Drive	18	8.4	20.5	0.1	18
Adrian Drive	17	16.4	24.8	0.1	11
Lasalle Avenue	16	17.5	39.5	0.2	18
	77	10.2	20.0	0.1	15
Charles Street	15	13.9	40.3	0.2	17
	69	4.4	9.9	0.0	17
La Plaza	33	9.1	14.7	0.0	11
Old Redwood Highway	9	40.4	46.8	0.1	4
Total		122.1	232.3	0.9	14

Arterial Level of Service: EB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
New N-S Street	22	26.5	46.6	0.2	19
West Cotati Avenue	2	46.9	66.4	0.2	12
Redwood Drive	3	55.4	77.8	0.2	11
SB US 101 On-ramp	4	21.0	31.0	0.1	11
NB US 101 Off-ramp	5	27.5	37.6	0.1	9
Old Redwood Highway	7	21.9	28.7	0.1	11
Total		199.3	288.1	0.9	12

Arterial Level of Service: WB Gravenstein Hwy #5

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	5	3.0	10.8	0.1	29
SB US 101 Off-ramp	4	6.7	15.2	0.1	21
Redwood Drive	3	23.9	32.7	0.1	10
West Cotati Avenue	2	16.2	37.6	0.2	21
New N-S Street	22	15.7	36.1	0.2	21
Madrone Avenue	21	22.4	43.8	0.2	20
Total		87.9	176.2	0.9	19

Arterial Level of Service: NB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	29	2.0	12.9	0.1	23
George Street	8	12.3	24.2	0.1	12
Gravenstein Way	7	54.9	83.9	0.3	11
Commerce Boulevard	6	18.1	30.3	0.1	13
Total		87.3	151.2	0.5	13

Arterial Level of Service: SB Old Redwood Highway #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Gravenstein Hwy #5	7	-	-	0.1	-
William Street	8	13.6	41.9	0.3	23
La Plaza	29	2.6	14.5	0.1	21
West Sierra Avenue #	9	19.9	30.9	0.1	9
Total		36.2	87.3	0.5	22

Arterial Level of Service: NB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	1.9	28.9	0.2	23
Total		1.9	28.9	0.2	23

Arterial Level of Service: WB Commerce Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Wilford Lane	28	0.5	8.5	0.1	26
NB US 101 On-ramp	6	41.2	67.3	0.2	10
Total		41.7	75.8	0.2	12

Arterial Level of Service: NB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	81	1.6	8.1	0.1	24
Charles Street	10	43.4	74.3	0.3	14
La Plaza	34	2.3	14.0	0.1	22
East Cotati Avenue #	9	32.5	38.2	0.0	4
Total		79.7	134.7	0.5	12

Arterial Level of Service: SB Old Redwood Highway #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	34	2.7	9.2	0.0	18
Henry Street	10	38.2	49.1	0.1	6
	81	3.1	35.6	0.3	28
Valparaiso Avenue	11	8.1	14.4	0.1	14
Total		52.0	108.3	0.5	15

Arterial Level of Service: EB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
NB US 101 Off-ramp	13	1.1	8.8	0.1	26
Valparaiso Avenue	38	2.2	30.8	0.3	32
East School Street	14	11.2	21.5	0.1	15
Henry Street	37	3.7	14.9	0.1	23
La Plaza	32	0.9	14.2	0.1	24
Old Redwood Highway	9	23.1	29.5	0.1	6
Total		42.2	119.6	0.7	20

Arterial Level of Service: WB West Sierra Avenue #4

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	32	1.9	9.4	0.1	19
Olaf Street	37	1.5	14.6	0.1	23
East School Street	14	13.3	24.9	0.1	13
Valparaiso Avenue	38	3.1	13.4	0.1	24
NB US 101 Off-ramp	13	1.3	32.4	0.3	31
West School Road	12	2.9	10.5	0.1	22
Total		24.1	105.2	0.7	23

Arterial Level of Service: EB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
La Plaza	33	1.6	8.9	0.1	21
	69	6.6	12.6	0.0	12
Charles Street	15	10.3	16.8	0.0	11
	77	2.7	25.7	0.2	27
Lasalle Avenue	16	15.1	25.5	0.1	12
	17	16.1	38.9	0.2	18
Lancaster Drive	18	12.7	21.6	0.1	12
Beverly Drive	39	2.2	14.5	0.1	26
Santero Way	19	10.7	24.1	0.1	18
Total		78.0	188.6	0.9	17

Arterial Level of Service: WB East Cotati Avenue #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Beverly Drive	39	1.8	15.5	0.1	27
Lancaster Drive	18	10.6	22.5	0.1	16
Adrian Drive	17	16.0	24.8	0.1	11
Lasalle Avenue	16	15.8	38.0	0.2	19
	77	9.7	19.6	0.1	16
Charles Street	15	14.4	41.5	0.2	17
	69	4.3	10.3	0.0	17
La Plaza	33	8.2	13.3	0.0	11
Old Redwood Highway	9	42.6	49.0	0.1	4
Total		123.5	234.6	0.9	14

FREEWAY FACILITIES LEVEL OF SERVICE CALCULATIONS

HCS 2010 Freeway Facilities

Project Properties

Analyst	W-Trans	**Freeway Name**	Existing Conditions	**Analysis Period**	PM Peak
Analysis Date	8/19/2013 4:53:13 PM	**From**	Railroad Ave	**Version Date**	10/10/2012
Agency		**To**	Rohnert Park Expressway		
Location	Sonoma County, CA	**Analysis Direction**	Northbound		
User Notes					
File Name	C:\Users\janand\AppData\Local\Temp\preview.xml				

Facility-wide Values

Jam Density (pc/h/ln)	190	**Time Period Duration (min)**	15	**Facility Length (mi)**	**3.38300**

Segment Input Data

Time Period 1

Mainline Data										
Seg #	**From**	**To**	**Type**	**Length**	**Terrain**	**Adj. Demand**	**% Trucks**	**% RVs**	**# Lanes**	**FFS**
1	Railroad Ave	W Sierra Ave	Basic Segment	5400	Rolling	3472	4.00	1.00	2	70
2	W Sierra Off		Off Ramp	1500	Rolling	3472	4.00	1.00	2	70
3	W Sierra Ave	SR 116	Basic Segment	1715	Level	3180	4.18	1.09	2	70
4	SR 116 Off		Off Ramp	1500	Level	3180	4.18	1.09	2	70
5	SR 116 Off	SR116 On	Basic Segment	2875	Level	2656	4.61	1.31	2	70
6	SR 116 On	RP Expressway off-ra	Weaving	3370	Level	3212	4.16	1.25	3	70
7	RP Expressway Off	RP Expressway EB On	Basic Segment	1500	Level	2616	4.65	1.54	2	70

RampData							
Seg #	**Type**	**Adj. Demand**	**% Trucks**	**% RVs**	**Lanes**	**Accel/Decel Length**	**FFS**
2	Off Ramp	292	2.00	0.00	1	140	40
4	Off Ramp	524	2.00	0.00	1	150	40

Weaving Segment Data											
Seg #	**Ramp to Ramp Prop.**	**On-Ramp**					**Off-Ramp**				
		Adj. Demand	**% Trucks**	**% RVs**	**Lanes**	**FFS**	**Adj. Demand**	**% Trucks**	**% RVs**	**Lanes**	**FFS**
6	0.050	556	2.00	1.00	1	40	596	2.00	0.00	1	40

Time Period Independent Weaving Segment Data

Seg #	Configuration	Short Length	# Weaving Lanes	Min. Lane Changes Freeway-Ramp	Min. Lane Changes Ramp-Freeway	Min. Lane Changes Ramp-Ramp
6	2595	2	1	1	0	

Time Period Results

Time Period 1

Seg #	From	To	Type	Adj. Demand	Vol. Served	Capacity (pc/h)	Capacity (veh/h)	d/c Ratio	v/c ratio	Queue Length (ft)	Avg. Speed (mi/h)	Density (pc/mi/in)	Density (veh/mi/in)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	Mainline Delay (min/veh)	System Delay (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)
1	Railroad Ave	W Sierra Ave	Basic Segment	3472	3472	4800	4486	0.77	0.77	0	65.0	28.6	26.7	0.94	0.88	0.1	0.1	887.7	887.7	13.7
2	W Sierra Off		Off Ramp	3472	3472	4800	4486	0.77	0.77	0	59.1	31.4	29.4	0.29	0.24	0.0	0.0	246.6	246.6	4.2
3	W Sierra Ave	SR 116	Basic Segment	3180	3180	4800	4692	0.68	0.68	0	67.9	24.0	23.4	0.29	0.28	0.0	0.0	258.2	258.2	3.8
4	SR 116 Off		Off Ramp	3180	3180	4800	4692	0.68	0.68	0	58.5	27.8	27.2	0.29	0.24	0.0	0.0	225.9	225.9	3.9
5	SR 116 Off	SR116 On	Basic Segment	2656	2656	4800	4680	0.57	0.57	0	69.7	19.6	19.1	0.47	0.47	0.0	0.0	361.6	361.6	5.2
6	SR 116 On	RP Expressway off-ra	Weaving	3212	3212	6422	6276	0.51	0.51	0	57.7	19.0	18.5	0.66	0.55	0.1	0.1	512.5	512.5	8.9
7	RP Expressway Off	RP Expressway EB On	Basic Segment	2616	2616	4800	4677	0.56	0.56	0	69.8	19.2	18.7	0.24	0.24	0.0	0.0	185.8	185.8	2.7

Overall Results

Segment	Segment Type	Maximum d/c Ratio	Avg. Speed (mi/h)	Density (pc/mi/in)	Density (veh/mi/in)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VHD (veh-hrs)
Railroad Ave-W Sierra Ave	Basic	0.77	65.0	28.6	26.7	0.94	0.88	0,887.7	0,887.7	13.66	0.98
W Sierra Off-	OffRamp	0.77	59.1	31.4	29.4	0.29	0.24	0,246.6	0,246.6	4.17	0.65
W Sierra Ave-SR 116	Basic	0.68	67.9	24.0	23.4	0.29	0.28	0,258.2	0,258.2	3.80	0.11
SR 116 Off-	OffRamp	0.68	58.5	27.8	27.2	0.29	0.24	0,225.9	0,225.9	3.86	0.63

SR 116 Off-SR116 On	Basic	0.57	69.7	19.6	19.1	0.47	0.47	0,361.6	0,361.6	5.19	0.02
SR 116 On-RP Expressway off-ra	Weaving	0.51	57.7	19.0	18.5	0.66	0.55	0,512.5	0,512.5	8.88	1.56
RP Expressway Off-RP Expressway EB On	Basic	0.56	69.8	19.2	18.7	0.24	0.24	0,185.8	0,185.8	2.66	0.01
Freeway			63.4	23.8	22.8	3.19	2.90	2,678.3	2,678.3	0,042.2	0,004.0

	Density-Based LOS by Segment						
Segment	1	2	3	4	5	6	7
Time Step	Basic	Off Ramp	Basic	Off Ramp	Basic	Weaving	Basic
1	D	D	C	C	C	B	C
	Demand-Based LOS by Segment						
Time Step	1	2	3	4	5	6	7
1	.	.	.	.	.	.	.

HCS 2010 Freeway Facilities

Project Properties

Analyst	W-Trans	**Freeway Name**	COT085	**Analysis Period**	PM Peak
Analysis Date	7/19/2013 10:36:29 AM	**From**	RP Expressway	**Version Date**	10/10/2012
Agency		**To**	Railroad Ave		
Location	Sonoma County, CA	**Analysis Direction**	Southbound		
User Notes					
File Name	C:\Users\janand\AppData\Local\Temp\preview.xml				

Facility-wide Values

Jam Density (pc/h/ln)	190	**Time Period Duration (min)**	15	**Facility Length (mi)**	**3.52900**

Segment Input Data

Time Period 1

Mainline Data

Seg #	From	To	Type	Length	Terrain	Adj. Demand	% Trucks	% RVs	# Lanes	FFS
1	RP Expwy Off	RP Expwy On	Basic Segment	1400	Level	2525	4.00	1.00	2	70
2	RP Expressway WB On		On Ramp	1045	Level	2744	3.84	0.92	2	70
3	RP Expressway	SR 116	Weaving	3580	Level	3014	3.68	0.84	3	70
4	SR 116 Off	SR 116 On	Basic Segment	2580	Level	2233	4.26	1.13	2	70
5	SR 116 On		On Ramp	1500	Level	2636	3.92	0.96	2	70
6	SR 116	W Sierra	Basic Segment	2030	Level	2636	3.92	0.96	2	70
7	W Sierra On		On Ramp	1500	Rolling	2782	3.82	0.91	2	70
8	W Sierra	Railraod	Basic Segment	5000	Rolling	2782	3.82	0.91	2	70

RampData

Seg #	Type	Adj. Demand	% Trucks	% RVs	Lanes	Accel/Decel Length	FFS
2	On Ramp	219	2.00	0.00	1	300	40
5	On Ramp	403	2.00	0.00	1	500	40
7	On Ramp	146	2.00	0.00	1	500	40

Weaving Segment Data

Seg #	Ramp to Ramp Prop.	On-Ramp					Off-Ramp				
		Adj. Demand	% Trucks	% RVs	Lanes	FFS	Adj. Demand	% Trucks	% RVs	Lanes	FFS
3	0.050	270	2.00	0.00	1	40	781	2.00	0.00	1	40

Time Period Independent Weaving Segment Data

Seg #	Configuration	Short Length	# Weaving Lanes	Min. Lane Changes Freeway-Ramp	Min. Lane Changes Ramp-Freeway	Min. Lane Changes Ramp-Ramp
3	2757	2	1	1	0	

Time Period Results

Time Period 1

Seg #	From	To	Type	Adj. Demand	Vol. Served	Capacity (pc/h)	Capacity (veh/h)	d/c Ratio	v/c ratio	Queue Length (ft)	Avg. Speed (mi/h)	Density (pc/mi/ln)	Density (veh/mi/ln)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	Mainline Delay (min/veh)	System Delay (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VH (ve hr
1	RP Expwy Off	RP Expwy On	Basic Segment	2525	2525	4800	4697	0.54	0.54	0	69.9	18.5	18.1	0.23	0.23	0.0	0.0	167.4	167.4	2.4	0
2	RP Expressway WB On		On Ramp	2744	2744	4800	4701	0.58	0.58	0	59.9	23.4	22.9	0.20	0.17	0.0	0.0	135.8	135.8	2.3	0
3	RP Expressway	SR 116	Weaving	3014	3014	6462	6335	0.48	0.48	0	58.5	17.5	17.2	0.70	0.58	0.1	0.1	510.9	510.9	8.7	1
4	SR 116 Off	SR 116 On	Basic Segment	2233	2233	4800	4689	0.48	0.48	0	69.9	16.3	16.0	0.42	0.42	0.0	0.0	272.8	272.8	3.9	0
5	SR 116 On		On Ramp	2636	2636	4800	4699	0.56	0.56	0	60.5	22.2	21.7	0.28	0.24	0.0	0.0	187.2	187.2	3.1	0
6	SR 116	W Sierra	Basic Segment	2636	2636	4800	4699	0.56	0.56	0	69.5	19.4	19.0	0.33	0.33	0.0	0.0	253.4	253.4	3.6	0
7	W Sierra On		On Ramp	2782	2782	4800	4502	0.62	0.62	0	60.0	24.7	23.1	0.28	0.24	0.0	0.0	197.6	197.6	3.3	0
8	W Sierra	Railraod	Basic Segment	2782	2782	4800	4502	0.62	0.62	0	69.1	21.5	20.1	0.82	0.81	0.0	0.0	658.6	658.6	9.5	0

Overall Results

Segment	Segment Type	Maximum d/c Ratio	Avg. Speed (mi/h)	Density (pc/mi/in)	Density (veh/mi/in)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VHD (veh-hrs)
RP Expwy Off-RP Expwy On	Basic	0.54	69.9	18.5	18.1	0.23	0.23	0,167.4	0,167.4	2.39	0.00
RP Expressway WB On-	OnRamp	0.58	59.9	23.4	22.9	0.20	0.17	0,135.8	0,135.8	2.27	0.33
RP Expressway-SR 116	Weaving	0.48	58.5	17.5	17.2	0.70	0.58	0,510.9	0,510.9	8.74	1.44
SR 116 Off-SR 116 On	Basic	0.48	69.9	16.3	16.0	0.42	0.42	0,272.8	0,272.8	3.90	0.00
SR 116 On-	OnRamp	0.56	60.5	22.2	21.7	0.28	0.24	0,187.2	0,187.2	3.09	0.42
SR 116-W Sierra	Basic	0.56	69.5	19.4	19.0	0.33	0.33	0,253.4	0,253.4	3.65	0.03
W Sierra On-	OnRamp	0.62	60.0	24.7	23.1	0.28	0.24	0,197.6	0,197.6	3.29	0.47
W Sierra-Railraod	Basic	0.62	69.1	21.5	20.1	0.82	0.81	0,658.6	0,658.6	9.54	0.13
Freeway			64.6	19.8	19.1	3.26	3.03	2,383.6	2,383.6	0,036.9	0,002.8

	Density-Based LOS by Segment							
Segment	1	2	3	4	5	6	7	8
Time Step	Basic	On Ramp	Weaving	Basic	On Ramp	Basic	On Ramp	Basic
1	C	C	B	B	C	C	C	C
	Demand-Based LOS by Segment							
Time Step	1	2	3	4	5	6	7	8
1	-	-	-	-	-	-	-	-

HCS 2010 Freeway Facilities

Project Properties

Analyst	W-Trans	**Freeway Name**	Future without Cotati Growth	**Analysis Period**	PM Peak
Analysis Date	10/21/2013 4:53:13 PM	**From**	Railroad Ave	**Version Date**	10/10/2012
Agency		**To**	Rohnert Park Expressway		
Location	Sonoma County, CA	**Analysis Direction**	Northbound		
User Notes					
File Name	C:\Users\zmatley\AppData\Local\Temp\preview.xml				

Facility-wide Values

Jam Density (pc/h/ln)	190	**Time Period Duration (min)**	15	**Facility Length (mi)**	**3.38300**

Segment Input Data

Time Period 1

Mainline Data

Seg #	From	To	Type	Length	Terrain	Adj. Demand	% Trucks	% RVs	# Lanes	FFS
1	Railroad Ave	W Sierra Ave	Basic Segment	5400	Rolling	4959	4.00	1.00	2	70
2	W Sierra Off		Off Ramp	1500	Rolling	4959	4.00	1.00	2	70
3	W Sierra Ave	SR 116	Basic Segment	1715	Level	4629	4.14	1.07	2	70
4	SR 116 Off		Off Ramp	1500	Level	4629	4.14	1.07	2	70
5	SR 116 Off	SR116 On	Basic Segment	2875	Level	4060	4.44	1.22	2	70
6	SR 116 On	RP Expressway off-ra	Weaving	3370	Level	4512	4.20	1.20	3	70
7	RP Expressway Off	RP Expressway EB On	Basic Segment	1500	Level	3525	4.81	1.54	2	70

RampData

Seg #	Type	Adj. Demand	% Trucks	% RVs	Lanes	Accel/Decel Length	FFS
2	Off Ramp	330	2.00	0.00	1	140	40
4	Off Ramp	569	2.00	0.00	1	150	40

Weaving Segment Data

Seg #	Ramp to Ramp Prop.	On-Ramp					Off-Ramp				
		Adj. Demand	% Trucks	% RVs	Lanes	FFS	Adj. Demand	% Trucks	% RVs	Lanes	FFS
6	0.050	452	2.00	1.00	1	40	987	2.00	0.00	1	40

Time Period Independent Weaving Segment Data

Seg #	Configuration	Short Length	# Weaving Lanes	Min. Lane Changes Freeway-Ramp	Min. Lane Changes Ramp-Freeway	Min. Lane Changes Ramp-Ramp
6	2595	2	1	1	0	

Time Period Results

Time Period 1

Seg #	From	To	Type	Adj. Demand	Vol. Served	Capacity (pc/h)	Capacity (veh/h)	d/c Ratio	v/c ratio	Queue Length (ft)	Avg. Speed (mi/h)	Density (pc/mi/in)	Density (veh/mi/in)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	Mainline Delay (min/veh)	System Delay (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)
1	Railroad Ave	W Sierra Ave	Basic Segment	4959	4500	4800	4486	1.11	1.00	0	53.1	45.4	42.4	1.16	0.88	0.3	0.3	1267.9	1150.6	21.7
2	W Sierra Off		Off Ramp	4959	4500	4800	4486	1.11	1.00	0	59.0	40.8	38.1	0.29	0.24	0.0	0.0	352.2	319.6	5.4
3	W Sierra Ave	SR 116	Basic Segment	4629	4200	4800	4693	0.99	0.89	0	59.6	36.1	35.2	0.33	0.28	0.0	0.0	375.9	341.1	5.7
4	SR 116 Off		Off Ramp	4629	4200	4800	4693	0.99	0.89	0	58.4	36.8	36.0	0.29	0.24	0.0	0.0	328.8	298.3	5.1
5	SR 116 Off	SR116 On	Basic Segment	4060	3660	4800	4684	0.87	0.78	0	64.7	29.0	28.3	0.50	0.47	0.0	0.0	552.7	498.2	7.7
6	SR 116 On	RP Expressway off-ra	Weaving	4512	4140	6502	6353	0.71	0.65	0	54.0	29.4	28.7	0.71	0.55	0.2	0.2	720.0	660.6	12.2
7	RP Expressway Off	RP Expressway EB On	Basic Segment	3525	3240	4800	4673	0.75	0.69	0	67.5	24.7	24.0	0.25	0.24	0.0	0.0	250.4	230.1	3.4

Overall Results

Segment	Segment Type	Maximum d/c Ratio	Avg. Speed (mi/h)	Density (pc/mi/in)	Density (veh/mi/in)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VHD (veh-hrs)
Railroad Ave-W Sierra Ave	Basic	1.11	53.1	45.4	42.4	1.16	0.88	1,267.9	1,150.6	21.67	5.24
W Sierra Off-	OffRamp	1.11	59.0	40.8	38.1	0.29	0.24	0,352.2	0,319.6	5.42	0.85
W Sierra Ave-SR 116	Basic	0.99	59.6	36.1	35.2	0.33	0.28	0,375.9	0,341.1	5.72	0.85
SR 116 Off-	OffRamp	0.99	58.4	36.8	36.0	0.29	0.24	0,328.8	0,298.3	5.11	0.85

SR 116 Off-SR116 On	Basic	0.87	64.7	29.0	28.3	0.50	0.47	0,552.7	0,498.2	7.70	0.58
SR 116 On-RP Expressway off-ra	Weaving	0.71	54.0	29.4	28.7	0.71	0.55	0,720.0	0,660.6	12.24	2.81
RP Expressway Off-RP Expressway EB On	Basic	0.75	67.5	24.7	24.0	0.25	0.24	0,250.4	0,230.1	3.41	0.12
Freeway			57.1	35.4	33.9	3.53	2.90	3,847.8	3,498.5	0,061.3	0,011.3

	Density-Based LOS by Segment						
Segment	1	2	3	4	5	6	7
Time Step	Basic	Off Ramp	Basic	Off Ramp	Basic	Weaving	Basic
1	F	E	E	E	D	D	C
	Demand-Based LOS by Segment						
Time Step	1	2	3	4	5	6	7
1	F	F	.	.	.	.	.

HCS 2010 Freeway Facilities

Project Properties

Analyst	W-Trans	**Freeway Name**	Future without Cotati Growth	**Analysis Period**	PM Peak
Analysis Date	7/19/2013 10:36:29 AM	**From**	RP Expressway	**Version Date**	10/10/2012
Agency		**To**	Railroad Ave		
Location	Sonoma County, CA	**Analysis Direction**	Southbound		
User Notes					
File Name	C:\Users\zmatley\AppData\Local\Temp\preview.xml				

Facility-wide Values

Jam Density (pc/h/ln)	190	**Time Period Duration (min)**	15	**Facility Length (mi)**	**3.52900**

Segment Input Data

Time Period 1

Mainline Data

Seg #	From	To	Type	Length	Terrain	Adj. Demand	% Trucks	% RVs	# Lanes	FFS
1	RP Expwy Off	RP Expwy On	Basic Segment	1400	Level	3073	4.00	1.00	2	70
2	RP Expressway WB On		On Ramp	1045	Level	3489	3.76	0.88	2	70
3	RP Expressway	SR 116	Weaving	3580	Level	3938	3.56	0.78	3	70
4	SR 116 Off	SR 116 On	Basic Segment	2580	Level	3371	3.82	0.91	2	70
5	SR 116 On		On Ramp	1500	Level	3914	3.57	0.79	2	70
6	SR 116	W Sierra	Basic Segment	2030	Level	3914	3.57	0.79	2	70
7	W Sierra On		On Ramp	1500	Rolling	4054	3.52	0.76	2	70
8	W Sierra	Railraod	Basic Segment	5000	Rolling	4054	3.52	0.76	2	70

RampData

Seg #	Type	Adj. Demand	% Trucks	% RVs	Lanes	Accel/Decel Length	FFS
2	On Ramp	416	2.00	0.00	1	300	40
5	On Ramp	543	2.00	0.00	1	500	40
7	On Ramp	140	2.00	0.00	1	500	40

Weaving Segment Data

Seg #	Ramp to Ramp Prop.	On-Ramp					Off-Ramp				
		Adj. Demand	% Trucks	% RVs	Lanes	FFS	Adj. Demand	% Trucks	% RVs	Lanes	FFS
3	0.050	449	2.00	0.00	1	40	567	2.00	0.00	1	40

Time Period Independent Weaving Segment Data

Seg #	Configuration	Short Length	# Weaving Lanes	Min. Lane Changes Freeway-Ramp	Min. Lane Changes Ramp-Freeway	Min. Lane Changes Ramp-Ramp
3	2757	2	1	1	0	

Time Period Results

Time Period 1

Seg #	From	To	Type	Adj. Demand	Vol. Served	Capacity (pc/h)	Capacity (veh/h)	d/c Ratio	v/c ratio	Queue Length (ft)	Avg. Speed (mi/h)	Density (pc/mi/ln)	Density (veh/mi/ln)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	Mainline Delay (min/veh)	System Delay (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VH (ve hr
1	RP Expwy Off	RP Expwy On	Basic Segment	3073	3073	4800	4697	0.65	0.65	0	68.4	23.0	22.5	0.23	0.23	0.0	0.0	203.7	203.7	3.0	0
2	RP Expressway WB On		On Ramp	3489	3489	4800	4703	0.74	0.74	0	57.9	30.7	30.1	0.21	0.17	0.0	0.0	172.6	172.6	3.0	0
3	RP Expressway	SR 116	Weaving	3938	3938	6688	6561	0.60	0.60	0	57.3	23.4	22.9	0.71	0.58	0.1	0.1	667.5	667.5	11.7	2
4	SR 116 Off	SR 116 On	Basic Segment	3371	3371	4800	4702	0.72	0.72	0	66.9	25.7	25.2	0.44	0.42	0.0	0.0	411.8	411.8	6.2	0
5	SR 116 On		On Ramp	3914	3914	4800	4709	0.83	0.83	0	56.3	35.4	34.7	0.30	0.24	0.1	0.1	278.0	278.0	4.9	1
6	SR 116	W Sierra	Basic Segment	3914	3914	4800	4709	0.83	0.83	0	62.7	31.8	31.2	0.37	0.33	0.0	0.0	376.2	376.2	6.0	0
7	W Sierra On		On Ramp	4054	4054	4800	4527	0.90	0.90	0	54.1	39.7	37.4	0.31	0.24	0.1	0.1	287.9	287.9	5.3	1
8	W Sierra	Railraod	Basic Segment	4054	4054	4800	4527	0.90	0.90	0	59.5	36.1	34.0	0.95	0.81	0.1	0.1	959.8	959.8	16.1	2

Overall Results

Segment	Segment Type	Maximum d/c Ratio	Avg. Speed (mi/h)	Density (pc/mi/ln)	Density (veh/mi/ln)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VHD (veh-hrs)
RP Expwy Off-RP Expwy On	Basic	0.65	68.4	23.0	22.5	0.23	0.23	0,203.7	0,203.7	2.98	0.07
RP Expressway WB On-	OnRamp	0.74	57.9	30.7	30.1	0.21	0.17	0,172.6	0,172.6	2.98	0.52
RP Expressway-SR 116	Weaving	0.60	57.3	23.4	22.9	0.71	0.58	0,667.5	0,667.5	11.65	2.12
SR 116 Off-SR 116 On	Basic	0.72	66.9	25.7	25.2	0.44	0.42	0,411.8	0,411.8	6.16	0.28
SR 116 On-	OnRamp	0.83	56.3	35.4	34.7	0.30	0.24	0,278.0	0,278.0	4.94	0.97
SR 116-W Sierra	Basic	0.83	62.7	31.8	31.2	0.37	0.33	0,376.2	0,376.2	6.00	0.63
W Sierra On-	OnRamp	0.90	54.1	39.7	37.4	0.31	0.24	0,287.9	0,287.9	5.32	1.21
W Sierra-Railraod	Basic	0.90	59.5	36.1	34.0	0.95	0.81	0,959.8	0,959.8	16.12	2.41
Freeway			59.8	30.1	29.0	3.53	3.03	3,357.5	3,357.5	0,056.2	0,008.2

	Density-Based LOS by Segment							
Segment	1	2	3	4	5	6	7	8
Time Step	Basic	On Ramp	Weaving	Basic	On Ramp	Basic	On Ramp	Basic
1	C	D	C	C	E	D	E	E
	Demand-Based LOS by Segment							
Time Step	1	2	3	4	5	6	7	8
1	.	.	.	.	.	.	.	.

HCS 2010 Freeway Facilities

Project Properties

Analyst	W-Trans	**Freeway Name**	Future plus Cotati Growth within City Limits	**Analysis Period**	PM Peak
Analysis Date	10/21/2013 4:53:13 PM	**From**	Railroad Ave	**Version Date**	10/10/2012
Agency		**To**	Rohnert Park Expressway		
Location	Sonoma County, CA	**Analysis Direction**	Northbound		
User Notes					
File Name	C:\Users\janand\AppData\Local\Temp\preview.xml				

Facility-wide Values

Jam Density (pc/h/ln)	190	**Time Period Duration (min)**	15	**Facility Length (mi)**	**3.38300**

Segment Input Data

Time Period 1

Mainline Data

Seg #	From	To	Type	Length	Terrain	Adj. Demand	% Trucks	% RVs	# Lanes	FFS
1	Railroad Ave	W Sierra Ave	Basic Segment	5400	Rolling	5425	4.00	1.00	2	70
2	W Sierra Off		Off Ramp	1500	Rolling	5425	4.00	1.00	2	70
3	W Sierra Ave	SR 116	Basic Segment	1715	Level	4917	4.21	1.10	2	70
4	SR 116 Off		Off Ramp	1500	Level	4917	4.21	1.10	2	70
5	SR 116 Off	SR116 On	Basic Segment	2875	Level	4076	4.66	1.33	2	70
6	SR 116 On	RP Expressway off-ra	Weaving	3370	Level	5305	4.05	1.25	3	70
7	RP Expressway Off	RP Expressway EB On	Basic Segment	1500	Level	4239	4.56	1.57	2	70

RampData

Seg #	Type	Adj. Demand	% Trucks	% RVs	Lanes	Accel/Decel Length	FFS
2	Off Ramp	508	2.00	0.00	1	140	40
4	Off Ramp	841	2.00	0.00	1	150	40

Weaving Segment Data

Seg #	Ramp to Ramp Prop.	On-Ramp					Off-Ramp				
		Adj. Demand	% Trucks	% RVs	Lanes	FFS	Adj. Demand	% Trucks	% RVs	Lanes	FFS
6	0.050	1229	2.00	1.00	1	40	1066	2.00	0.00	1	40

Time Period Independent Weaving Segment Data

Seg #	Configuration	Short Length	# Weaving Lanes	Min. Lane Changes Freeway-Ramp	Min. Lane Changes Ramp-Freeway	Min. Lane Changes Ramp-Ramp
6	2595	2	1	1	0	

Time Period Results

Time Period 1

Seg #	From	To	Type	Adj. Demand	Vol. Served	Capacity (pc/h)	Capacity (veh/h)	d/c Ratio	v/c ratio	Queue Length (ft)	Avg. Speed (mi/h)	Density (pc/mi/in)	Density (veh/mi/in)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	Mainline Delay (min/veh)	System Delay (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)
1	Railroad Ave	W Sierra Ave	Basic Segment	5425	4500	4800	4486	1.21	1.00	0	53.1	45.4	42.4	1.16	0.88	0.3	0.3	1387.1	1150.6	21.7
2	W Sierra Off		Off Ramp	5425	4500	4800	4486	1.21	1.00	0	58.5	41.1	38.5	0.29	0.24	0.0	0.0	385.3	319.6	5.5
3	W Sierra Ave	SR 116	Basic Segment	4917	4080	4800	4691	1.05	0.87	0	60.9	34.3	33.5	0.32	0.28	0.0	0.0	399.3	331.3	5.4
4	SR 116 Off		Off Ramp	4917	4080	4800	4691	1.05	0.87	0	57.7	36.2	35.4	0.30	0.24	0.1	0.1	349.2	289.8	5.0
5	SR 116 Off	SR116 On	Basic Segment	4076	3360	4800	4678	0.87	0.72	0	66.8	25.8	25.1	0.49	0.47	0.0	0.0	554.9	457.4	6.8
6	SR 116 On	RP Expressway off-ra	Weaving	5305	4620	5927	5795	0.92	0.80	0	49.5	36.5	35.7	0.77	0.55	0.2	0.2	846.5	737.2	14.9
7	RP Expressway Off	RP Expressway EB On	Basic Segment	4239	3660	4800	4679	0.91	0.78	0	64.7	29.0	28.3	0.26	0.24	0.0	0.0	301.1	259.9	4.0

Overall Results

Segment	Segment Type	Maximum d/c Ratio	Avg. Speed (mi/h)	Density (pc/mi/in)	Density (veh/mi/in)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VHD (veh-hrs)
Railroad Ave-W Sierra Ave	Basic	1.21	53.1	45.4	42.4	1.16	0.88	1,387.1	1,150.6	21.67	5.24
W Sierra Off-	OffRamp	1.21	58.5	41.1	38.5	0.29	0.24	0,385.3	0,319.6	5.46	0.90
W Sierra Ave-SR 116	Basic	1.05	60.9	34.3	33.5	0.32	0.28	0,399.3	0,331.3	5.44	0.71
SR 116 Off-	OffRamp	1.05	57.7	36.2	35.4	0.30	0.24	0,349.2	0,289.8	5.02	0.88

SR 116 Off-SR116 On	Basic	0.87	66.8	25.8	25.1	0.49	0.47	0,554.9	0,457.4	6.85	0.31
SR 116 On-RP Expressway off-ra	Weaving	0.92	49.5	36.5	35.7	0.77	0.55	0,846.5	0,737.2	14.89	4.35
RP Expressway Off-RP Expressway EB On	Basic	0.91	64.7	29.0	28.3	0.26	0.24	0,301.1	0,259.9	4.02	0.31
Freeway			56.0	36.9	35.4	3.59	2.90	4,223.3	3,545.8	0,063.4	0,012.7

	Density-Based LOS by Segment						
Segment	1	2	3	4	5	6	7
Time Step	Basic	Off Ramp	Basic	Off Ramp	Basic	Weaving	Basic
1	F	E	D	E	C	E	D
	Demand-Based LOS by Segment						
Time Step	1	2	3	4	5	6	7
1	F	F	F	F	-	-	-

HCS 2010 Freeway Facilities

Project Properties

Analyst	W-Trans	**Freeway Name**	Future plus Cotati Growth within City Limits	**Analysis Period**	PM Peak
Analysis Date	7/19/2013 10:36:29 AM	**From**	RP Expressway	**Version Date**	10/10/2012
Agency		**To**	Railroad Ave		
Location	Sonoma County, CA	**Analysis Direction**	Southbound		
User Notes					
File Name	C:\Users\janand\AppData\Local\Temp\preview.xml				

Facility-wide Values

Jam Density (pc/h/ln)	190	**Time Period Duration (min)**	15	**Facility Length (mi)**	**3.52900**

Segment Input Data

Time Period 1

Mainline Data

Seg #	From	To	Type	Length	Terrain	Adj. Demand	% Trucks	% RVs	# Lanes	FFS
1	RP Expwy Off	RP Expwy On	Basic Segment	1400	Level	3541	4.00	1.00	2	70
2	RP Expressway WB On		On Ramp	1045	Level	3983	3.78	0.89	2	70
3	RP Expressway	SR 116	Weaving	3580	Level	4458	3.59	0.79	3	70
4	SR 116 Off	SR 116 On	Basic Segment	2580	Level	3398	4.08	1.04	2	70
5	SR 116 On		On Ramp	1500	Level	4431	3.60	0.80	2	70
6	SR 116	W Sierra	Basic Segment	2030	Level	4431	3.60	0.80	2	70
7	W Sierra On		On Ramp	1500	Rolling	4736	3.50	0.75	2	70
8	W Sierra	Railraod	Basic Segment	5000	Rolling	4736	3.50	0.75	2	70

RampData

Seg #	Type	Adj. Demand	% Trucks	% RVs	Lanes	Accel/Decel Length	FFS
2	On Ramp	442	2.00	0.00	1	300	40
5	On Ramp	1033	2.00	0.00	1	500	40
7	On Ramp	305	2.00	0.00	1	500	40

Weaving Segment Data

Seg #	Ramp to Ramp Prop.	On-Ramp					Off-Ramp				
		Adj. Demand	% Trucks	% RVs	Lanes	FFS	Adj. Demand	% Trucks	% RVs	Lanes	FFS
3	0.050	475	2.00	0.00	1	40	1060	2.00	0.00	1	40

Time Period Independent Weaving Segment Data

Seg #	Configuration	Short Length	# Weaving Lanes	Min. Lane Changes Freeway-Ramp	Min. Lane Changes Ramp-Freeway	Min. Lane Changes Ramp-Ramp
3	2757	2	1	1	0	

Time Period Results

Time Period 1

Seg #	From	To	Type	Adj. Demand	Vol. Served	Capacity (pc/h)	Capacity (veh/h)	d/c Ratio	v/c ratio	Queue Length (ft)	Avg. Speed (mi/h)	Density (pc/mi/ln)	Density (veh/mi/ln)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	Mainline Delay (min/veh)	System Delay (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VH (ve hr
1	RP Expwy Off	RP Expwy On	Basic Segment	3541	3540	4800	4697	0.75	0.75	0	65.7	27.5	26.9	0.24	0.23	0.0	0.0	234.7	234.7	3.6	0
2	RP Expressway WB On		On Ramp	3983	3960	4800	4703	0.85	0.84	0	55.5	36.3	35.6	0.21	0.17	0.0	0.0	197.1	195.9	3.5	0
3	RP Expressway	SR 116	Weaving	4458	4440	6477	6353	0.70	0.70	0	54.8	24.7	24.3	0.74	0.58	0.2	0.2	755.7	752.6	13.7	3
4	SR 116 Off	SR 116 On	Basic Segment	3398	3299	4800	4694	0.72	0.70	1046	50.8	32.5	31.7	0.58	0.42	0.2	0.2	415.1	403.0	7.9	2
5	SR 116 On		On Ramp	4431	4275	4800	4708	0.94	0.91	1500	40.1	53.3	52.3	0.42	0.24	0.2	0.2	314.7	303.6	7.6	3
6	SR 116	W Sierra	Basic Segment	4431	4200	4800	4708	0.94	0.89	2030	37.0	56.8	55.7	0.62	0.33	0.3	0.3	425.9	403.7	10.9	5
7	W Sierra On		On Ramp	4736	4500	4800	4529	1.05	0.99	0	49.5	48.0	45.3	0.34	0.24	0.1	0.1	336.4	319.6	6.5	1
8	W Sierra	Railraod	Basic Segment	4736	4500	4800	4529	1.05	0.99	0	53.7	44.4	41.9	1.06	0.81	0.2	0.2	1121.2	1065.3	19.8	4

Overall Results

Segment	Segment Type	Maximum d/c Ratio	Avg. Speed (mi/h)	Density (pc/mi/in)	Density (veh/mi/in)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VHD (veh-hrs)
RP Expwy Off-RP Expwy On	Basic	0.75	65.7	27.5	26.9	0.24	0.23	0,234.7	0,234.7	3.57	0.22
RP Expressway WB On-	OnRamp	0.85	55.5	36.3	35.6	0.21	0.17	0,197.1	0,195.9	3.53	0.73
RP Expressway-SR 116	Weaving	0.70	54.8	24.7	24.3	0.74	0.58	0,755.7	0,752.6	13.74	2.98
SR 116 Off-SR 116 On	Basic	0.72	50.8	32.5	31.7	0.58	0.42	0,415.1	0,403.0	7.93	2.17
SR 116 On-	OnRamp	0.94	40.1	53.3	52.3	0.42	0.24	0,314.7	0,303.6	7.57	3.23
SR 116-W Sierra	Basic	0.94	37.0	56.8	55.7	0.62	0.33	0,425.9	0,403.7	10.92	5.15
W Sierra On-	OnRamp	1.05	49.5	48.0	45.3	0.34	0.24	0,336.4	0,319.6	6.46	1.89
W Sierra-Railraod	Basic	1.05	53.7	44.4	41.9	1.06	0.81	1,121.2	1,065.3	19.83	4.61
Freeway			50.0	38.3	37.0	4.23	3.03	3,800.7	3,678.5	0,073.5	0,021.0

	Density-Based LOS by Segment							
Segment	1	2	3	4	5	6	7	8
Time Step	Basic	On Ramp	Weaving	Basic	On Ramp	Basic	On Ramp	Basic
1	D	E	C	D	F	F	E	E
	Demand-Based LOS by Segment							
Time Step	1	2	3	4	5	6	7	8
1	-	-	-	-	-	-	F	F

HCS 2010 Freeway Facilities

Project Properties

Analyst	W-Trans	**Freeway Name**	Future plus Cotati Growth within Sphere of Influence	**Analysis Period**	PM Peak
Analysis Date	10/21/2013 4:53:13 PM	**From**	Railroad Ave	**Version Date**	10/10/2012
Agency		**To**	Rohnert Park Expressway		
Location	Sonoma County, CA	**Analysis Direction**	Northbound		
User Notes					
File Name	C:\Users\janand\AppData\Local\Temp\preview.xml				

Facility-wide Values

Jam Density (pc/h/ln)	190	**Time Period Duration (min)**	15	**Facility Length (mi)**	**3.38300**

Segment Input Data

Time Period 1

Mainline Data

Seg #	From	To	Type	Length	Terrain	Adj. Demand	% Trucks	% RVs	# Lanes	FFS
1	Railroad Ave	W Sierra Ave	Basic Segment	5400	Rolling	5550	4.00	1.00	2	70
2	W Sierra Off		Off Ramp	1500	Rolling	5550	4.00	1.00	2	70
3	W Sierra Ave	SR 116	Basic Segment	1715	Level	5017	4.21	1.11	2	70
4	SR 116 Off		Off Ramp	1500	Level	5017	4.21	1.11	2	70
5	SR 116 Off	SR116 On	Basic Segment	2875	Level	4084	4.72	1.36	2	70
6	SR 116 On	RP Expressway off-ra	Weaving	3370	Level	5490	4.02	1.27	3	70
7	RP Expressway Off	RP Expressway EB On	Basic Segment	1500	Level	4405	4.52	1.58	2	70

RampData

Seg #	Type	Adj. Demand	% Trucks	% RVs	Lanes	Accel/Decel Length	FFS
2	Off Ramp	533	2.00	0.00	1	140	40
4	Off Ramp	933	2.00	0.00	1	150	40

Weaving Segment Data

Seg #	Ramp to Ramp Prop.	On-Ramp					Off-Ramp				
		Adj. Demand	% Trucks	% RVs	Lanes	FFS	Adj. Demand	% Trucks	% RVs	Lanes	FFS
6	0.050	1406	2.00	1.00	1	40	1085	2.00	0.00	1	40

Time Period Independent Weaving Segment Data

Seg #	Configuration	Short Length	# Weaving Lanes	Min. Lane Changes Freeway-Ramp	Min. Lane Changes Ramp-Freeway	Min. Lane Changes Ramp-Ramp
6	2595	2	1	1	0	

Time Period Results

Time Period 1

Seg #	From	To	Type	Adj. Demand	Vol. Served	Capacity (pc/h)	Capacity (veh/h)	d/c Ratio	v/c ratio	Queue Length (ft)	Avg. Speed (mi/h)	Density (pc/mi/ln)	Density (veh/mi/ln)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	Mainline Delay (min/veh)	System Delay (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)
1	Railroad Ave	W Sierra Ave	Basic Segment	5550	4500	4800	4486	1.24	1.00	0	53.1	45.4	42.4	1.16	0.88	0.3	0.3	1419.0	1150.6	21.7
2	W Sierra Off		Off Ramp	5550	4500	4800	4486	1.24	1.00	0	58.5	41.2	38.5	0.29	0.24	0.0	0.0	394.2	319.6	5.5
3	W Sierra Ave	SR 116	Basic Segment	5017	4080	4800	4691	1.07	0.87	0	60.9	34.3	33.5	0.32	0.28	0.0	0.0	407.4	331.3	5.4
4	SR 116 Off		Off Ramp	5017	4080	4800	4691	1.07	0.87	0	57.5	36.3	35.5	0.30	0.24	0.1	0.1	356.3	289.8	5.0
5	SR 116 Off	SR116 On	Basic Segment	4084	3300	4800	4677	0.87	0.71	0	67.2	25.2	24.6	0.49	0.47	0.0	0.0	555.9	449.2	6.7
6	SR 116 On	RP Expressway off-ra	Weaving	5490	4680	5666	5541	0.99	0.84	0	48.5	38.5	37.6	0.79	0.55	0.2	0.2	876.0	746.8	15.4
7	RP Expressway Off	RP Expressway EB On	Basic Segment	4405	3780	4800	4679	0.94	0.81	0	63.7	30.4	29.7	0.27	0.24	0.0	0.0	312.9	268.5	4.2

Overall Results

Segment	Segment Type	Maximum d/c Ratio	Avg. Speed (mi/h)	Density (pc/mi/in)	Density (veh/mi/in)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VHD (veh-hrs)
Railroad Ave-W Sierra Ave	Basic	1.24	53.1	45.4	42.4	1.16	0.88	1,419.0	1,150.6	21.67	5.24
W Sierra Off-	OffRamp	1.24	58.5	41.2	38.5	0.29	0.24	0,394.2	0,319.6	5.47	0.90
W Sierra Ave-SR 116	Basic	1.07	60.9	34.3	33.5	0.32	0.28	0,407.4	0,331.3	5.44	0.71
SR 116	OffRamp	1.07	57.5	36.3	35.5	0.30	0.24	0,356.3	0,289.8	5.04	0.90

Off-											
SR 116 Off-SR116 On	Basic	0.87	67.2	25.2	24.6	0.49	0.47	0,555.9	0,449.2	6.69	0.27
SR 116 On-RP Expressway off-ra	Weaving	0.99	48.5	38.5	37.6	0.79	0.55	0,876.0	0,746.8	15.39	4.72
RP Expressway Off-RP Expressway EB On	Basic	0.94	63.7	30.4	29.7	0.27	0.24	0,312.9	0,268.5	4.22	0.38
Freeway			55.6	37.5	35.9	3.61	2.90	4,321.7	3,555.7	0,063.9	0,013.1

	Density-Based LOS by Segment						
Segment	1	2	3	4	5	6	7
Time Step	Basic	Off Ramp	Basic	Off Ramp	Basic	Weaving	Basic
1	F	E	D	E	C	E	D
	Demand-Based LOS by Segment						
Time Step	1	2	3	4	5	6	7
1	F	F	F	F	-	-	-

HCS 2010 Freeway Facilities

Project Properties

Analyst	W-Trans	**Freeway Name**	Future plus Cotati Growth within Sphere of Influence	**Analysis Period**	PM Peak
Analysis Date	7/19/2013 10:36:29 AM	**From**	RP Expressway	**Version Date**	10/10/2012
Agency		**To**	Railroad Ave		
Location	Sonoma County, CA	**Analysis Direction**	Southbound		
User Notes					
File Name	C:\Users\janand\AppData\Local\Temp\preview.xml				

Facility-wide Values

Jam Density (pc/h/ln)	190	**Time Period Duration (min)**	15	**Facility Length (mi)**	**3.52900**

Segment Input Data

Time Period 1

Mainline Data

Seg #	From	To	Type	Length	Terrain	Adj. Demand	% Trucks	% RVs	# Lanes	FFS
1	RP Expwy Off	RP Expwy On	Basic Segment	1400	Level	3643	4.00	1.00	2	70
2	RP Expressway WB On		On Ramp	1045	Level	4085	3.78	0.89	2	70
3	RP Expressway	SR 116	Weaving	3580	Level	4571	3.59	0.80	3	70
4	SR 116 Off	SR 116 On	Basic Segment	2580	Level	3411	4.14	1.07	2	70
5	SR 116 On		On Ramp	1500	Level	4657	3.56	0.78	2	70
6	SR 116	W Sierra	Basic Segment	2030	Level	4657	3.56	0.78	2	70
7	W Sierra On		On Ramp	1500	Rolling	4979	3.46	0.73	2	70
8	W Sierra	Railraod	Basic Segment	5000	Rolling	4979	3.46	0.73	2	70

RampData

Seg #	Type	Adj. Demand	% Trucks	% RVs	Lanes	Accel/Decel Length	FFS
2	On Ramp	442	2.00	0.00	1	300	40
5	On Ramp	1246	2.00	0.00	1	500	40
7	On Ramp	322	2.00	0.00	1	500	40

Weaving Segment Data

Seg #	Ramp to Ramp Prop.	On-Ramp					Off-Ramp				
		Adj. Demand	% Trucks	% RVs	Lanes	FFS	Adj. Demand	% Trucks	% RVs	Lanes	FFS
3	0.050	486	2.00	0.00	1	40	1160	2.00	0.00	1	40

Time Period Independent Weaving Segment Data

Seg #	Configuration	Short Length	# Weaving Lanes	Min. Lane Changes Freeway-Ramp	Min. Lane Changes Ramp-Freeway	Min. Lane Changes Ramp-Ramp
3	2757	2	1	1	0	

Time Period Results

Time Period 1

Seg #	From	To	Type	Adj. Demand	Vol. Served	Capacity (pc/h)	Capacity (veh/h)	d/c Ratio	v/c ratio	Queue Length (ft)	Avg. Speed (mi/h)	Density (pc/mi/in)	Density (veh/mi/in)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	Mainline Delay (min/veh)	System Delay (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VH (ve hr
1	RP Expwy Off	RP Expwy On	Basic Segment	3643	3660	4800	4697	0.78	0.78	0	64.8	28.9	28.2	0.25	0.23	0.0	0.0	241.5	242.6	3.7	0
2	RP Expressway WB On		On Ramp	4085	4080	4800	4703	0.87	0.87	0	54.7	38.0	37.2	0.22	0.17	0.0	0.0	202.1	201.9	3.7	0
3	RP Expressway	SR 116	Weaving	4571	4528	6437	6313	0.72	0.72	232	51.4	29.4	28.8	0.79	0.58	0.2	0.2	774.8	767.5	14.9	4
4	SR 116 Off	SR 116 On	Basic Segment	3411	3122	4800	4693	0.73	0.67	2580	26.7	58.4	57.1	1.10	0.42	0.7	0.7	416.7	381.4	14.3	8
5	SR 116 On		On Ramp	4657	4257	4800	4709	0.99	0.90	1500	36.4	58.5	57.4	0.47	0.24	0.2	0.6	330.8	302.3	8.3	4
6	SR 116	W Sierra	Basic Segment	4657	4200	4800	4709	0.99	0.89	2030	35.3	59.5	58.4	0.65	0.33	0.3	0.3	447.6	403.7	11.4	5
7	W Sierra On		On Ramp	4979	4560	4800	4531	1.10	1.01	0	48.7	49.4	46.6	0.35	0.24	0.1	0.1	353.6	323.9	6.6	2
8	W Sierra	Railraod	Basic Segment	4979	4560	4800	4531	1.10	1.01	0	52.9	45.7	43.1	1.07	0.81	0.3	0.3	1178.7	1079.5	20.4	5

Overall Results

Segment	Segment Type	Maximum d/c Ratio	Avg. Speed (mi/h)	Density (pc/mi/in)	Density (veh/mi/in)	Avg. Travel Time (min/veh)	Free-Flow Travel Time (min/veh)	VMT Demand (veh-min)	VMT Volume (veh-min)	VHT (veh-hrs)	VHD (veh-hrs)
RP Expwy Off-RP Expwy On	Basic	0.78	64.8	28.9	28.2	0.25	0.23	0,241.5	0,242.6	3.74	0.28
RP Expressway WB On-	OnRamp	0.87	54.7	38.0	37.2	0.22	0.17	0,202.1	0,201.9	3.69	0.81

RP Expressway-SR 116	Weaving	0.72	51.4	29.4	28.8	0.79	0.58	0,774.8	0,767.5	14.94	3.98
SR 116 Off-SR 116 On	Basic	0.73	26.7	58.4	57.1	1.10	0.42	0,416.7	0,381.4	14.26	8.82
SR 116 On-	OnRamp	0.99	36.4	58.5	57.4	0.47	0.24	0,330.8	0,302.3	8.31	3.99
SR 116-W Sierra	Basic	0.99	35.3	59.5	58.4	0.65	0.33	0,447.6	0,403.7	11.44	5.67
W Sierra On-	OnRamp	1.10	48.7	49.4	46.6	0.35	0.24	0,353.6	0,323.9	6.65	2.02
W Sierra-Railraod	Basic	1.10	52.9	45.7	43.1	1.07	0.81	1,178.7	1,079.5	20.42	5.00
Freeway			44.4	44.0	42.6	4.90	3.03	3,945.8	3,702.8	0,083.5	0,030.6

	Density-Based LOS by Segment							
Segment	1	2	3	4	5	6	7	8
Time Step	Basic	On Ramp	Weaving	Basic	On Ramp	Basic	On Ramp	Basic
1	D	E	D	F	F	F	E	F
	Demand-Based LOS by Segment							
Time Step	1	2	3	4	5	6	7	8
1	-	-	-	-	-	-	F	F

FREEWAY OFF-RAMP QUEUING CALCULATIONS

Intersection: 4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	L	TR
Maximum Queue (ft)	62	92	85	110	79	63	60	88	72
Average Queue (ft)	35	62	52	75	47	33	29	61	47
95th Queue (ft)	82	109	96	124	90	74	66	106	77
Link Distance (ft)	407	407		400	400	400		1134	1134
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			300				550		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
AM Peak Hour - Existing Conditions 11/6/2013

Intersection: 5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	L	L	R
Maximum Queue (ft)	70	103	68	58	39	51	50	34
Average Queue (ft)	38	61	37	28	18	29	23	14
95th Queue (ft)	82	115	82	74	47	57	59	41
Link Distance (ft)	400	400	379	379	379		1394	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)						650		880
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	L	TR
Maximum Queue (ft)	84	176	67	111	127	102	242	282	77
Average Queue (ft)	40	101	41	68	87	65	134	210	47
95th Queue (ft)	97	187	74	138	154	128	273	304	85
Link Distance (ft)	407	407		400	400	400		1134	1134
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			300				550		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	L	L	R
Maximum Queue (ft)	98	275	22	48	40	129	126	115
Average Queue (ft)	42	165	6	18	15	80	77	70
95th Queue (ft)	117	313	29	54	47	137	142	133
Link Distance (ft)	400	400	379	379	379		1394	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)						650		880
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	L	TR
Maximum Queue (ft)	146	248	235	189	97	79	176	221	116
Average Queue (ft)	80	143	118	114	46	32	75	151	65
95th Queue (ft)	148	244	220	194	99	80	163	226	109
Link Distance (ft)	407	407		400	400	400		1134	1134
Upstream Blk Time (%)		0							
Queuing Penalty (veh)		0							
Storage Bay Dist (ft)			300				550		
Storage Blk Time (%)		0	0						
Queuing Penalty (veh)		2	0						

Intersection: 5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	L	L	R
Maximum Queue (ft)	112	221	83	59	53	93	86	95
Average Queue (ft)	54	117	41	25	19	50	41	49
95th Queue (ft)	113	221	88	61	53	92	82	90
Link Distance (ft)	400	400	379	379	379		1394	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)						650		880
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	L	TR
Maximum Queue (ft)	95	186	98	113	277	270	260	317	209
Average Queue (ft)	48	111	59	61	162	131	119	207	93
95th Queue (ft)	102	192	98	115	289	264	256	317	225
Link Distance (ft)	407	407		400	400	400		1134	1134
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			300				550		
Storage Blk Time (%)		0							
Queuing Penalty (veh)		0							

Queuing and Blocking Report
PM Peak Hour - Future No Project 8/22/2014

Intersection: 5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	L	L	R
Maximum Queue (ft)	78	142	47	91	83	129	121	205
Average Queue (ft)	24	60	13	39	27	83	67	120
95th Queue (ft)	74	136	44	90	77	136	116	208
Link Distance (ft)	400	400	379	379	379		1394	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)						650		880
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	L	TR
Maximum Queue (ft)	308	420	403	205	165	221	189	262	493
Average Queue (ft)	199	322	257	135	91	143	97	174	359
95th Queue (ft)	356	482	488	253	198	254	222	281	554
Link Distance (ft)	406	406	406	400	400	400		1134	1134
Upstream Blk Time (%)	0	12	6						
Queuing Penalty (veh)	0	58	29						
Storage Bay Dist (ft)							550		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
AM Peak Hour - Future Growth within City Limits 11/5/2013

Intersection: 5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	L	L	R
Maximum Queue (ft)	82	160	87	87	114	217	247	142
Average Queue (ft)	38	82	46	53	80	158	205	88
95th Queue (ft)	91	178	103	108	132	243	273	163
Link Distance (ft)	400	400	378	378	378		1394	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)						650		880
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	L	TR
Maximum Queue (ft)	267	384	369	133	165	204	273	347	368
Average Queue (ft)	176	305	221	88	98	113	179	250	256
95th Queue (ft)	327	463	464	151	199	254	329	376	499
Link Distance (ft)	406	406	406	400	400	400		1134	1134
Upstream Blk Time (%)		6	2						
Queuing Penalty (veh)		50	21						
Storage Bay Dist (ft)							550		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
PM Peak Hour - Future Growth within City Limits 11/5/2013

Intersection: 5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	L	L	R
Maximum Queue (ft)	326	378	32	56	55	235	269	427
Average Queue (ft)	235	305	10	27	27	168	205	308
95th Queue (ft)	398	448	36	65	65	316	337	504
Link Distance (ft)	400	400	378	378	378		1394	
Upstream Blk Time (%)	2	4						
Queuing Penalty (veh)	19	40						
Storage Bay Dist (ft)						650		880
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	L	TR	R
Maximum Queue (ft)	248	378	356	228	262	290	262	313	504	249
Average Queue (ft)	170	291	224	149	125	178	149	233	328	230
95th Queue (ft)	298	430	407	255	304	378	295	353	590	283
Link Distance (ft)	394	394	394	401	401	401		1134	1134	
Upstream Blk Time (%)		2	1		0	0				
Queuing Penalty (veh)		11	4		0	0				
Storage Bay Dist (ft)							550			150
Storage Blk Time (%)									27	32
Queuing Penalty (veh)									123	149

Intersection: 5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	L	L	R
Maximum Queue (ft)	176	326	143	118	134	315	353	144
Average Queue (ft)	110	216	69	71	75	229	276	90
95th Queue (ft)	192	348	151	132	159	348	399	160
Link Distance (ft)	401	401	382	382	382		1391	
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		1						
Storage Bay Dist (ft)						650		880
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: SB US 101 On-ramp/SB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	L	TR	R
Maximum Queue (ft)	365	408	404	166	239	263	587	758	490	194
Average Queue (ft)	244	322	260	108	174	199	439	535	236	137
95th Queue (ft)	409	458	466	182	282	289	681	869	630	223
Link Distance (ft)	394	394	394	401	401	401		1134	1134	
Upstream Blk Time (%)	1	8	4					1	1	
Queuing Penalty (veh)	8	83	39					0	0	
Storage Bay Dist (ft)							550			150
Storage Blk Time (%)							1	25	14	6
Queuing Penalty (veh)							1	74	41	17

Intersection: 5: NB US 101 Off-ramp & Gravenstein Hwy #5

Movement	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	L	L	R
Maximum Queue (ft)	358	428	21	20	60	239	271	474
Average Queue (ft)	185	296	1	4	10	175	207	332
95th Queue (ft)	348	448	12	21	42	252	282	544
Link Distance (ft)	401	401	382	382	382		1391	
Upstream Blk Time (%)	0	3						
Queuing Penalty (veh)	1	32						
Storage Bay Dist (ft)						650		880
Storage Blk Time (%)								
Queuing Penalty (veh)								