

Appendix B – Existing Conditions Level of Service Worksheets

HCM Unsignalized Intersection Capacity Analysis 1: Project Entrance & Sherburne Hills Rd

A.M. Peak
08/08/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	24	0	0	0	1	10
Future Volume (Veh/h)	24	0	0	0	1	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.92	0.92	0.69	0.69
Hourly flow rate (vph)	28	0	0	0	1	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	0				56	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				56	0
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				100	99
cM capacity (veh/h)	1623				935	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	28	0	15			
Volume Left	28	0	1			
Volume Right	0	0	14			
cSH	1623	1700	1074			
Volume to Capacity	0.02	0.00	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	7.3	0.0	8.4			
Lane LOS	A		A			
Approach Delay (s)	7.3	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay			7.7			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

2: Sherburne Hills Rd & Camino Tassajara

A.M. Peak
08/08/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	606	8	3	1057	61	17	0	6	40	2	61
Future Volume (vph)	35	606	8	3	1057	61	17	0	6	40	2	61
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	
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	1.00		1.00	1.00			0.99	
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		1.00	0.85			0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1770	3531		1770	3506		1768	1583			1669	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00			0.87	
Satd. Flow (perm)	1770	3531		1770	3506		1269	1583			1484	
Peak-hour factor, PHF	0.82	0.82	0.82	0.98	0.98	0.98	0.82	0.82	0.82	0.72	0.72	0.72
Adj. Flow (vph)	43	739	10	3	1079	62	21	0	7	56	3	85
RTOR Reduction (vph)	0	1	0	0	3	0	0	6	0	0	71	0
Lane Group Flow (vph)	43	748	0	3	1138	0	21	1	0	0	73	0
Confl. Peds. (#/hr)			3				3	2				2
Confl. Bikes (#/hr)						3						
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.4	31.3		0.8	29.7		9.0	9.0			9.0	
Effective Green, g (s)	2.4	31.3		0.8	29.7		9.0	9.0			9.0	
Actuated g/C Ratio	0.05	0.59		0.02	0.56		0.17	0.17			0.17	
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)	80	2081		26	1960		215	268			251	
v/s Ratio Prot	c0.02	0.21		0.00	c0.32			0.00				
v/s Ratio Perm							0.02				c0.05	
v/c Ratio	0.54	0.36		0.12	0.58		0.10	0.00			0.29	
Uniform Delay, d1	24.8	5.7		25.8	7.6		18.6	18.3			19.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	6.8	0.1		2.0	0.4		0.2	0.0			0.7	
Delay (s)	31.6	5.8		27.8	8.1		18.8	18.3			19.9	
Level of Service	C	A		C	A		B	B			B	
Approach Delay (s)		7.2			8.1			18.7			19.9	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		8.7					HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio		0.51										
Actuated Cycle Length (s)		53.1					Sum of lost time (s)		12.0			
Intersection Capacity Utilization		51.7%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: Creekside Ave./Holbrook Dr & Camino Tassajara

A.M. Peak
08/08/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	546	11	7	1032	70	31	6	24	37	1	58
Future Volume (vph)	84	546	11	7	1032	70	31	6	24	37	1	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			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	1.00			0.99		1.00	1.00	
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			0.95		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1770	3527		1770	3500			1711		1770	1588	
Flt Permitted	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1770	3527		1770	3500			1711		1770	1588	
Peak-hour factor, PHF	0.81	0.81	0.81	0.95	0.95	0.95	0.90	0.90	0.90	0.52	0.52	0.52
Adj. Flow (vph)	104	674	14	7	1086	74	34	7	27	71	2	112
RTOR Reduction (vph)	0	1	0	0	4	0	0	25	0	0	103	0
Lane Group Flow (vph)	104	687	0	7	1156	0	0	43	0	71	11	0
Confl. Peds. (#/hr)			1				1		1			
Confl. Bikes (#/hr)						4						
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												
Actuated Green, G (s)	8.1	52.7		1.1	45.7			7.3		6.9	6.9	
Effective Green, g (s)	8.1	52.7		1.1	45.7			7.3		6.9	6.9	
Actuated g/C Ratio	0.10	0.62		0.01	0.54			0.09		0.08	0.08	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Vehicle Extension (s)	1.8	4.0		1.8	4.0			2.0		2.0	2.0	
Lane Grp Cap (vph)	168	2186		22	1881			146		143	128	
v/s Ratio Prot	c0.06	0.19		0.00	c0.33			c0.03		c0.04	0.01	
v/s Ratio Perm												
v/c Ratio	0.62	0.31		0.32	0.61			0.30		0.50	0.09	
Uniform Delay, d1	37.0	7.6		41.6	13.6			36.4		37.4	36.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	4.7	0.4		3.0	1.5			0.4		1.0	0.1	
Delay (s)	41.7	8.0		44.6	15.1			36.9		38.4	36.2	
Level of Service	D	A		D	B			D		D	D	
Approach Delay (s)		12.4			15.3			36.9			37.1	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			16.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			85.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			56.9%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 4: Crow Canyon Rd/Blackhawk Rd & Camino Tassajara

A.M. Peak
08/08/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	325	207	601	555	152	293	264	211	105	337	144
Future Volume (vph)	151	325	207	601	555	152	293	264	211	105	337	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95		0.97	0.91	0.91	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	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	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.97	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1563	4990	3415		3433	3280	1421	3433	3539	1563
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1563	4990	3415		3433	3280	1421	3433	3539	1563
Peak-hour factor, PHF	0.90	0.90	0.90	0.86	0.86	0.86	0.95	0.95	0.95	0.83	0.83	0.83
Adj. Flow (vph)	168	361	230	699	645	177	308	278	222	127	406	173
RTOR Reduction (vph)	0	0	184	0	15	0	0	12	112	0	0	137
Lane Group Flow (vph)	168	361	46	699	807	0	308	335	41	127	406	36
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)						3			1			1
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	9.7	18.8	18.8	23.2	32.3		14.0	25.0	25.0	8.5	19.5	19.5
Effective Green, g (s)	9.7	18.8	18.8	23.2	32.3		14.0	25.0	25.0	8.5	19.5	19.5
Actuated g/C Ratio	0.10	0.20	0.20	0.25	0.35		0.15	0.27	0.27	0.09	0.21	0.21
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0		2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	356	711	314	1238	1179		514	877	379	312	738	325
v/s Ratio Prot	0.05	c0.10		0.14	c0.24		c0.09	0.10		0.04	c0.11	
v/s Ratio Perm			0.03						0.03			0.02
v/c Ratio	0.47	0.51	0.15	0.56	0.68		0.60	0.38	0.11	0.41	0.55	0.11
Uniform Delay, d1	39.5	33.2	30.8	30.7	26.2		37.1	27.9	25.8	40.1	33.1	30.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.8	0.3	0.4	1.8		1.3	0.4	0.2	0.3	1.1	0.2
Delay (s)	39.8	34.0	31.0	31.1	28.0		38.4	28.3	26.0	40.4	34.2	30.2
Level of Service	D	C	C	C	C		D	C	C	D	C	C
Approach Delay (s)		34.4			29.4			31.7			34.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			93.5			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			57.2%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
5: Camino Ramon/Driveway & Sycamore Valley Rd

A.M. Peak
08/08/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 					
Traffic Volume (vph)	23	650	306	100	1292	13	456	8	72	7	10	25
Future Volume (vph)	23	650	306	100	1292	13	456	8	72	7	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8		5.4	5.4		4.7	4.7	4.7
Lane Util. Factor	1.00	0.91	1.00	1.00	0.86		0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	0.93		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	1.00		1.00	0.86		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	5085	1583	1770	6395		3433	1490		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)	1770	5085	1583	1770	6395		3433	1490		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.88	0.88	0.88	0.55	0.55	0.55
Adj. Flow (vph)	26	722	340	109	1404	14	518	9	82	13	18	45
RTOR Reduction (vph)	0	0	133	0	1	0	0	64	0	0	0	42
Lane Group Flow (vph)	26	722	207	109	1417	0	518	27	0	13	18	3
Confl. Peds. (#/hr)							16			58		
Confl. Bikes (#/hr)										1		
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases			2									7
Actuated Green, G (s)	5.4	66.8	66.8	13.5	74.9		31.1	31.1		8.0	8.0	8.0
Effective Green, g (s)	5.4	66.8	66.8	13.5	74.9		31.1	31.1		8.0	8.0	8.0
Actuated g/C Ratio	0.04	0.48	0.48	0.10	0.54		0.22	0.22		0.06	0.06	0.06
Clearance Time (s)	4.7	5.8	5.8	4.7	5.8		5.4	5.4		4.7	4.7	4.7
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	68	2426	755	170	3421		762	330		101	106	90
v/s Ratio Prot	0.01	0.14		c0.06	c0.22		c0.15	0.02		0.01	c0.01	
v/s Ratio Perm			0.13									0.00
v/c Ratio	0.38	0.30	0.27	0.64	0.41		0.68	0.08		0.13	0.17	0.03
Uniform Delay, d1	65.7	22.3	22.0	60.9	19.4		49.9	43.1		62.7	62.8	62.3
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	1.3	0.3	0.9	6.1	0.4		1.9	0.0		0.2	0.3	0.0
Delay (s)	67.0	22.6	22.9	67.0	19.8		51.8	43.2		62.9	63.1	62.4
Level of Service	E	C	C	E	B		D	D		E	E	E
Approach Delay (s)		23.8			23.2			50.5			62.6	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			29.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				20.6		
Intersection Capacity Utilization			77.8%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: Project Entrance & Sherburne Hills Rd

Midday Peak
08/08/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	0	0	0	3	20
Future Volume (Veh/h)	13	0	0	0	3	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.54	0.54	0.92	0.92	0.82	0.82
Hourly flow rate (vph)	24	0	0	0	4	24
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	0				48	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				48	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1623				947	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	24	0	28			
Volume Left	24	0	4			
Volume Right	0	0	24			
cSH	1623	1700	1063			
Volume to Capacity	0.01	0.00	0.03			
Queue Length 95th (ft)	1	0	2			
Control Delay (s)	7.3	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	7.3	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			7.9			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis 2: Sherburne Hills Rd & Camino Tassajara

Midday Peak
08/08/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	829	10	16	756	67	12	0	6	65	1	64
Future Volume (vph)	50	829	10	16	756	67	12	0	6	65	1	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	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frbp, ped/bikes	1.00	1.00		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	
Frt	1.00	1.00		1.00	0.99		1.00	0.85			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1770	3532		1770	3489		1770	1583			1696	
Flt Permitted	0.95	1.00		0.95	1.00		0.75	1.00			0.84	
Satd. Flow (perm)	1770	3532		1770	3489		1391	1583			1457	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.75	0.75	0.75	0.79	0.79	0.79
Adj. Flow (vph)	54	901	11	18	859	76	16	0	8	82	1	81
RTOR Reduction (vph)	0	1	0	0	7	0	0	7	0	0	68	0
Lane Group Flow (vph)	54	911	0	18	928	0	16	1	0	0	96	0
Confl. Peds. (#/hr)			1			6						
Confl. Bikes (#/hr)			3			2						
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.4	19.7		0.7	19.0		6.3	6.3			6.3	
Effective Green, g (s)	1.4	19.7		0.7	19.0		6.3	6.3			6.3	
Actuated g/C Ratio	0.04	0.51		0.02	0.49		0.16	0.16			0.16	
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)	64	1797		32	1712		226	257			237	
v/s Ratio Prot	c0.03	0.26		0.01	c0.27			0.00				
v/s Ratio Perm							0.01				c0.07	
v/c Ratio	0.84	0.51		0.56	0.54		0.07	0.01			0.41	
Uniform Delay, d1	18.5	6.3		18.8	6.8		13.7	13.6			14.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	60.7	0.2		20.7	0.4		0.1	0.0			1.1	
Delay (s)	79.2	6.5		39.5	7.2		13.9	13.6			15.7	
Level of Service	E	A		D	A		B	B			B	
Approach Delay (s)		10.6			7.8			13.8			15.7	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			9.8			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			38.7			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			51.6%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: Creekside Ave./Holbrook Dr & Camino Tassajara

Midday Peak
08/08/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	783	23	15	742	44	16	3	8	57	2	77
Future Volume (vph)	72	783	23	15	742	44	16	3	8	57	2	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		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	
Frt	1.00	1.00		1.00	0.99			0.96		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1770	3522		1770	3503			1731		1770	1590	
Flt Permitted	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (perm)	1770	3522		1770	3503			1731		1770	1590	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.96	0.96	0.96	0.49	0.49	0.49
Adj. Flow (vph)	77	842	25	16	798	47	17	3	8	116	4	157
RTOR Reduction (vph)	0	1	0	0	3	0	0	7	0	0	140	0
Lane Group Flow (vph)	77	866	0	16	842	0	0	21	0	116	21	0
Confl. Peds. (#/hr)							7		2			
Confl. Bikes (#/hr)			4			2						
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												
Actuated Green, G (s)	7.2	54.8		1.3	48.9			7.2		9.7	9.7	
Effective Green, g (s)	7.2	54.8		1.3	48.9			7.2		9.7	9.7	
Actuated g/C Ratio	0.08	0.61		0.01	0.54			0.08		0.11	0.11	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Vehicle Extension (s)	1.8	4.0		1.8	4.0			2.0		2.0	2.0	
Lane Grp Cap (vph)	141	2144		25	1903			138		190	171	
v/s Ratio Prot	c0.04	0.25		0.01	c0.24			c0.01		c0.07	0.01	
v/s Ratio Perm												
v/c Ratio	0.55	0.40		0.64	0.44			0.15		0.61	0.12	
Uniform Delay, d1	39.8	9.1		44.1	12.4			38.5		38.3	36.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.6		35.0	0.7			0.2		4.0	0.1	
Delay (s)	42.1	9.7		79.1	13.1			38.7		42.4	36.4	
Level of Service	D	A		E	B			D		D	D	
Approach Delay (s)		12.3			14.3			38.7			38.9	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			17.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			46.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Crow Canyon Rd/Blackhawk Rd & Camino Tassajara

Midday Peak
08/08/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	463	176	341	372	187	313	379	296	150	277	168
Future Volume (vph)	166	463	176	341	372	187	313	379	296	150	277	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95		0.97	0.91	0.91	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98	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	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.97	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1558	4990	3338		3433	3282	1415	3433	3539	1561
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1558	4990	3338		3433	3282	1415	3433	3539	1561
Peak-hour factor, PHF	0.96	0.96	0.96	0.89	0.89	0.89	0.94	0.94	0.94	0.91	0.91	0.91
Adj. Flow (vph)	173	482	183	383	418	210	333	403	315	165	304	185
RTOR Reduction (vph)	0	0	138	0	42	0	0	12	160	0	0	145
Lane Group Flow (vph)	173	482	45	383	586	0	333	486	60	165	304	40
Confl. Peds. (#/hr)			5			10			5			1
Confl. Bikes (#/hr)									2			1
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	9.5	20.5	20.5	12.5	23.5		13.8	22.4	22.4	9.3	17.9	17.9
Effective Green, g (s)	9.5	20.5	20.5	12.5	23.5		13.8	22.4	22.4	9.3	17.9	17.9
Actuated g/C Ratio	0.11	0.25	0.25	0.15	0.28		0.17	0.27	0.27	0.11	0.22	0.22
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0		2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	394	877	386	754	948		572	888	383	386	765	337
v/s Ratio Prot	0.05	c0.14		0.08	c0.18		c0.10	c0.15		0.05	0.09	
v/s Ratio Perm			0.03						0.04			0.03
v/c Ratio	0.44	0.55	0.12	0.51	0.62		0.58	0.55	0.16	0.43	0.40	0.12
Uniform Delay, d1	34.1	27.1	24.1	32.3	25.7		31.8	25.8	23.0	34.2	27.8	26.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.9	0.2	0.2	1.4		1.0	0.9	0.3	0.3	0.5	0.2
Delay (s)	34.4	28.0	24.3	32.5	27.1		32.8	26.7	23.2	34.5	28.2	26.3
Level of Service	C	C	C	C	C		C	C	C	C	C	C
Approach Delay (s)		28.5			29.1			27.9			29.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			82.7			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			57.4%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
5: Camino Ramon/Driveway & Sycamore Valley Rd

Midday Peak
08/08/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	963	361	58	882	8	414	3	91	2	1	19
Future Volume (vph)	21	963	361	58	882	8	414	3	91	2	1	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8		5.4	5.4		4.7	4.7	4.7
Lane Util. Factor	1.00	0.91	1.00	1.00	0.86		0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	0.96		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	1.00		1.00	0.85		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	5085	1583	1770	6398		3433	1526		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)	1770	5085	1583	1770	6398		3433	1526		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.89	0.89	0.89	0.88	0.88	0.88	0.79	0.79	0.79
Adj. Flow (vph)	22	993	372	65	991	9	470	3	103	3	1	24
RTOR Reduction (vph)	0	0	92	0	0	0	0	82	0	0	0	23
Lane Group Flow (vph)	22	993	280	65	1000	0	470	24	0	3	1	1
Confl. Peds. (#/hr)						1			24			
Confl. Bikes (#/hr)									1			
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases			2									7
Actuated Green, G (s)	5.4	76.4	76.4	8.7	79.7		28.3	28.3		6.0	6.0	6.0
Effective Green, g (s)	5.4	76.4	76.4	8.7	79.7		28.3	28.3		6.0	6.0	6.0
Actuated g/C Ratio	0.04	0.55	0.55	0.06	0.57		0.20	0.20		0.04	0.04	0.04
Clearance Time (s)	4.7	5.8	5.8	4.7	5.8		5.4	5.4		4.7	4.7	4.7
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	68	2774	863	109	3642		693	308		75	79	67
v/s Ratio Prot	0.01	c0.20		c0.04	c0.16		c0.14	0.02		c0.00	0.00	
v/s Ratio Perm			0.18									0.00
v/c Ratio	0.32	0.36	0.32	0.60	0.27		0.68	0.08		0.04	0.01	0.02
Uniform Delay, d1	65.5	18.0	17.6	63.9	15.4		51.6	45.3		64.2	64.2	64.2
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	1.0	0.4	1.0	5.7	0.2		2.1	0.0		0.1	0.0	0.0
Delay (s)	66.5	18.3	18.6	69.7	15.6		53.7	45.3		64.3	64.2	64.2
Level of Service	E	B	B	E	B		D	D		E	E	E
Approach Delay (s)		19.1			18.9			52.2			64.2	
Approach LOS		B			B			D			E	
Intersection Summary												
HCM 2000 Control Delay			25.7			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				20.6		
Intersection Capacity Utilization			74.7%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 1: Sherburne Hills Rd

P.M. Peak
08/08/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	0	0	0	3	20
Future Volume (Veh/h)	18	0	0	0	3	20
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)	20	0	0	0	3	22
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	0				40	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				40	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1623				960	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	20	0	25			
Volume Left	20	0	3			
Volume Right	0	0	22			
cSH	1623	1700	1068			
Volume to Capacity	0.01	0.00	0.02			
Queue Length 95th (ft)	1	0	2			
Control Delay (s)	7.2	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	7.2	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			7.9			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis 2: Sherburne Hills Rd & Camino Tassajara

P.M. Peak
08/08/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	1099	17	7	653	43	11	2	6	45	0	42
Future Volume (vph)	43	1099	17	7	653	43	11	2	6	45	0	42
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	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frbp, ped/bikes	1.00	1.00		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	
Frt	1.00	1.00		1.00	0.99		1.00	0.88			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	
Satd. Flow (prot)	1770	3530		1770	3500		1770	1648			1697	
Flt Permitted	0.95	1.00		0.95	1.00		0.81	1.00			0.83	
Satd. Flow (perm)	1770	3530		1770	3500		1514	1648			1446	
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.59	0.59	0.59	0.73	0.73	0.73
Adj. Flow (vph)	46	1182	18	8	710	47	19	3	10	62	0	58
RTOR Reduction (vph)	0	1	0	0	4	0	0	9	0	0	63	0
Lane Group Flow (vph)	46	1199	0	8	753	0	19	4	0	0	57	0
Confl. Peds. (#/hr)			2			4						
Confl. Bikes (#/hr)			6			10						
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.7	25.2		0.8	24.3		5.7	5.7			5.7	
Effective Green, g (s)	1.7	25.2		0.8	24.3		5.7	5.7			5.7	
Actuated g/C Ratio	0.04	0.58		0.02	0.56		0.13	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)	68	2035		32	1946		197	214			188	
v/s Ratio Prot	c0.03	c0.34		0.00	0.22			0.00				
v/s Ratio Perm							0.01				c0.04	
v/c Ratio	0.68	0.59		0.25	0.39		0.10	0.02			0.30	
Uniform Delay, d1	20.7	5.9		21.2	5.5		16.7	16.6			17.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	23.5	0.4		4.1	0.1		0.2	0.0			0.9	
Delay (s)	44.2	6.4		25.2	5.6		16.9	16.6			18.1	
Level of Service	D	A		C	A		B	B			B	
Approach Delay (s)		7.8			5.8			16.8			18.1	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			7.8			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			43.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			54.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: Creekside Ave./Holbrook Dr & Camino Tassajara

P.M. Peak
08/08/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1051	32	26	629	67	18	2	10	49	1	44
Future Volume (vph)	57	1051	32	26	629	67	18	2	10	49	1	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			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	1.00			0.99		1.00	1.00	
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			0.95		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1770	3521		1770	3477			1717		1770	1588	
Flt Permitted	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (perm)	1770	3521		1770	3477			1717		1770	1588	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.63	0.63	0.63	0.76	0.76	0.76
Adj. Flow (vph)	63	1155	35	28	684	73	29	3	16	64	1	58
RTOR Reduction (vph)	0	1	0	0	5	0	0	15	0	0	54	0
Lane Group Flow (vph)	63	1189	0	28	752	0	0	33	0	64	5	0
Confl. Peds. (#/hr)			3			4			5			
Confl. Bikes (#/hr)			6			8						
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												
Actuated Green, G (s)	6.6	55.6		2.9	51.9			7.7		6.8	6.8	
Effective Green, g (s)	6.6	55.6		2.9	51.9			7.7		6.8	6.8	
Actuated g/C Ratio	0.07	0.62		0.03	0.58			0.09		0.08	0.08	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Vehicle Extension (s)	1.8	4.0		1.8	4.0			2.0		2.0	2.0	
Lane Grp Cap (vph)	129	2175		57	2005			146		133	119	
v/s Ratio Prot	c0.04	c0.34		0.02	0.22			c0.02		c0.04	0.00	
v/s Ratio Perm												
v/c Ratio	0.49	0.55		0.49	0.38			0.23		0.48	0.05	
Uniform Delay, d1	40.1	9.9		42.8	10.3			38.4		39.9	38.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	1.1	1.0		2.4	0.5			0.3		1.0	0.1	
Delay (s)	41.1	10.9		45.2	10.8			38.7		40.9	38.6	
Level of Service	D	B		D	B			D		D	D	
Approach Delay (s)		12.4			12.1			38.7			39.8	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			14.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			55.3%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 4: Crow Canyon Rd/Blackhawk Rd & Camino Tassajara

P.M. Peak
08/08/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	626	200	307	403	202	403	454	419	203	304	151
Future Volume (vph)	173	626	200	307	403	202	403	454	419	203	304	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95		0.97	0.91	0.91	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98	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	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.96	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1552	4990	3323		3433	3250	1418	3433	3539	1551
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1552	4990	3323		3433	3250	1418	3433	3539	1551
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.98	0.98	0.98	0.93	0.93	0.93
Adj. Flow (vph)	192	696	222	330	433	217	411	463	428	218	327	162
RTOR Reduction (vph)	0	0	144	0	40	0	0	18	196	0	0	125
Lane Group Flow (vph)	192	696	78	330	610	0	411	599	78	218	327	37
Confl. Peds. (#/hr)			8			19			2			8
Confl. Bikes (#/hr)						3			2			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	10.4	29.1	29.1	12.3	31.0		16.8	28.1	28.1	11.2	22.5	22.5
Effective Green, g (s)	10.4	29.1	29.1	12.3	31.0		16.8	28.1	28.1	11.2	22.5	22.5
Actuated g/C Ratio	0.11	0.29	0.29	0.12	0.31		0.17	0.28	0.28	0.11	0.23	0.23
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0		2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	361	1043	457	621	1043		584	925	403	389	806	353
v/s Ratio Prot	0.06	c0.20		0.07	c0.18		c0.12	c0.18		0.06	0.09	
v/s Ratio Perm			0.05						0.06			0.02
v/c Ratio	0.53	0.67	0.17	0.53	0.59		0.70	0.65	0.19	0.56	0.41	0.10
Uniform Delay, d1	41.8	30.6	25.8	40.5	28.4		38.6	31.0	26.7	41.4	32.4	30.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.8	0.2	0.4	1.0		3.1	1.8	0.3	1.1	0.5	0.2
Delay (s)	42.6	32.3	26.1	40.9	29.4		41.8	32.7	27.0	42.5	32.9	30.3
Level of Service	D	C	C	D	C		D	C	C	D	C	C
Approach Delay (s)		32.9			33.3			34.4			35.3	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			33.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			98.7			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			63.4%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 5: Camino Ramon/Driveway & Sycamore Valley Rd

P.M. Peak
08/08/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1210	514	80	602	6	437	6	127	32	22	93
Future Volume (vph)	30	1210	514	80	602	6	437	6	127	32	22	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8		5.4	5.4		4.7	4.7	4.7
Lane Util. Factor	1.00	0.91	1.00	1.00	0.86		0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	0.89		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	1.00		1.00	0.86		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	5085	1583	1770	6397		3433	1425		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)	1770	5085	1583	1770	6397		3433	1425		1770	1863	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.96	0.96	0.96	0.90	0.90	0.90	0.72	0.72	0.72
Adj. Flow (vph)	31	1235	524	83	627	6	486	7	141	44	31	129
RTOR Reduction (vph)	0	0	129	0	1	0	0	107	0	0	0	120
Lane Group Flow (vph)	31	1235	395	83	632	0	486	41	0	44	31	9
Confl. Peds. (#/hr)						5			83			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases			2									7
Actuated Green, G (s)	5.5	61.1	61.1	14.1	69.7		34.0	34.0		10.2	10.2	10.2
Effective Green, g (s)	5.5	61.1	61.1	14.1	69.7		34.0	34.0		10.2	10.2	10.2
Actuated g/C Ratio	0.04	0.44	0.44	0.10	0.50		0.24	0.24		0.07	0.07	0.07
Clearance Time (s)	4.7	5.8	5.8	4.7	5.8		5.4	5.4		4.7	4.7	4.7
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	69	2219	690	178	3184		833	346		128	135	115
v/s Ratio Prot	0.02	0.24		c0.05	0.10		c0.14	0.03		c0.02	0.02	
v/s Ratio Perm			c0.25									0.01
v/c Ratio	0.45	0.56	0.57	0.47	0.20		0.58	0.12		0.34	0.23	0.08
Uniform Delay, d1	65.8	29.4	29.6	59.4	19.6		46.8	41.3		61.7	61.2	60.5
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	1.7	1.0	3.4	0.7	0.1		0.7	0.1		0.6	0.3	0.1
Delay (s)	67.5	30.4	33.1	60.1	19.7		47.4	41.4		62.3	61.5	60.6
Level of Service	E	C	C	E	B		D	D		E	E	E
Approach Delay (s)		31.8			24.4			46.0			61.1	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			34.7			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				20.6		
Intersection Capacity Utilization			78.5%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												