

Appendix C – Existing plus Project Conditions Level of Service Worksheets

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

A.M. Peak
12/13/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	24	0	0	38	15	10
Future Volume (vph)	24	0	0	38	15	10
Peak Hour Factor	0.86	0.86	0.92	0.92	0.69	0.69
Hourly flow rate (vph)	28	0	0	41	22	14
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	28	41	36			
Volume Left (vph)	28	0	22			
Volume Right (vph)	0	41	14			
Hadj (s)	0.23	-0.57	-0.08			
Departure Headway (s)	4.2	3.4	4.0			
Degree Utilization, x	0.03	0.04	0.04			
Capacity (veh/h)	834	1029	882			
Control Delay (s)	7.4	6.6	7.1			
Approach Delay (s)	7.4	6.6	7.1			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.0			
Level of Service			A			
Intersection Capacity Utilization			18.0%	ICU Level of Service	A	
Analysis Period (min)			15			

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

A.M. Peak
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	601	19	5	1044	61	44	0	17	40	2	61
Future Volume (vph)	35	601	19	5	1044	61	44	0	17	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	3521		1770	3505		1768	1583			1669	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00			0.87	
Satd. Flow (perm)	1770	3521		1770	3505		1273	1583			1475	
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	733	23	5	1065	62	54	0	21	56	3	85
RTOR Reduction (vph)	0	2	0	0	3	0	0	17	0	0	70	0
Lane Group Flow (vph)	43	754	0	5	1124	0	54	4	0	0	74	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	31.0		0.8	29.4		9.1	9.1			9.1	
Effective Green, g (s)	2.4	31.0		0.8	29.4		9.1	9.1			9.1	
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	2063		26	1947		218	272			253	
v/s Ratio Prot	c0.02	0.21		0.00	c0.32			0.00				
v/s Ratio Perm							0.04				c0.05	
v/c Ratio	0.54	0.37		0.19	0.58		0.25	0.01			0.29	
Uniform Delay, d1	24.7	5.8		25.7	7.7		18.9	18.2			19.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	6.8	0.1		3.6	0.4		0.6	0.0			0.6	
Delay (s)	31.5	5.9		29.3	8.1		19.5	18.2			19.7	
Level of Service	C	A		C	A		B	B			B	
Approach Delay (s)		7.3			8.2			19.2			19.7	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		9.0					HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio		0.51										
Actuated Cycle Length (s)		52.9					Sum of lost time (s)		12.0			
Intersection Capacity Utilization		51.3%					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
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	552	11	7	1034	70	31	6	24	37	1	58
Future Volume (vph)	71	552	11	7	1034	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)	88	681	14	7	1088	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)	88	694	0	7	1158	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)	7.5	52.7		1.1	46.3			7.3		6.9	6.9	
Effective Green, g (s)	7.5	52.7		1.1	46.3			7.3		6.9	6.9	
Actuated g/C Ratio	0.09	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)	156	2186		22	1906			146		143	128	
v/s Ratio Prot	c0.05	0.20		0.00	c0.33			c0.03		c0.04	0.01	
v/s Ratio Perm												
v/c Ratio	0.56	0.32		0.32	0.61			0.30		0.50	0.09	
Uniform Delay, d1	37.2	7.6		41.6	13.2			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	2.8	0.4		3.0	1.5			0.4		1.0	0.1	
Delay (s)	39.9	8.0		44.6	14.6			36.9		38.4	36.2	
Level of Service	D	A		D	B			D		D	D	
Approach Delay (s)		11.6			14.8			36.9			37.1	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			16.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			85.0			Sum of lost time (s)				17.0		
Intersection Capacity Utilization			56.3%			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

A.M. Peak
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	330	208	601	557	152	293	264	211	105	337	144
Future Volume (vph)	151	330	208	601	557	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
Flpb, 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	367	231	699	648	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	367	47	699	810	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	18.9	18.9	23.2	32.4		14.0	25.0	25.0	8.5	19.5	19.5
Effective Green, g (s)	9.7	18.9	18.9	23.2	32.4		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)	355	714	315	1236	1182		513	876	379	311	737	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	0.57	0.69		0.60	0.38	0.11	0.41	0.55	0.11
Uniform Delay, d1	39.5	33.3	30.7	30.8	26.2		37.2	28.0	25.9	40.2	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		1.4	0.4	0.2	0.3	1.1	0.2
Delay (s)	39.9	34.1	31.0	31.1	28.0		38.5	28.4	26.1	40.5	34.2	30.2
Level of Service	D	C	C	C	C		D	C	C	D	C	C
Approach Delay (s)		34.4			29.5			31.8			34.4	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			93.6			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
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 					
Traffic Volume (vph)	23	655	306	100	1306	13	456	8	72	7	10	25
Future Volume (vph)	23	655	306	100	1306	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	728	340	109	1420	14	518	9	82	13	18	45
RTOR Reduction (vph)	0	0	132	0	1	0	0	64	0	0	0	42
Lane Group Flow (vph)	26	728	208	109	1433	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	0.28	0.64	0.42		0.68	0.08		0.13	0.17	0.03
Uniform Delay, d1	65.7	22.3	22.0	60.9	19.5		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	22.7	22.9	67.0	19.9		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
12/13/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	13	0	0	18	32	20
Future Volume (vph)	13	0	0	18	32	20
Peak Hour Factor	0.54	0.54	0.92	0.92	0.82	0.82
Hourly flow rate (vph)	24	0	0	20	39	24
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	24	20	63			
Volume Left (vph)	24	0	39			
Volume Right (vph)	0	20	24			
Hadj (s)	0.23	-0.57	-0.07			
Departure Headway (s)	4.3	3.5	3.9			
Degree Utilization, x	0.03	0.02	0.07			
Capacity (veh/h)	822	1006	896			
Control Delay (s)	7.4	6.6	7.2			
Approach Delay (s)	7.4	6.6	7.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.1			
Level of Service			A			
Intersection Capacity Utilization			17.4%	ICU Level of Service	A	
Analysis Period (min)			15			

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

Midday Peak
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	819	31	21	750	67	25	0	11	65	1	64
Future Volume (vph)	50	819	31	21	750	67	25	0	11	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	
Frpb, 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	0.99		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	3517		1770	3488		1770	1583			1696	
Flt Permitted	0.95	1.00		0.95	1.00		0.75	1.00			0.83	
Satd. Flow (perm)	1770	3517		1770	3488		1392	1583			1450	
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	890	34	24	852	76	33	0	15	82	1	81
RTOR Reduction (vph)	0	2	0	0	7	0	0	13	0	0	68	0
Lane Group Flow (vph)	54	922	0	24	921	0	33	2	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	19.6		0.7	18.9		6.3	6.3			6.3	
Effective Green, g (s)	1.4	19.6		0.7	18.9		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	1785		32	1707		227	258			236	
v/s Ratio Prot	c0.03	0.26		0.01	c0.26			0.00				
v/s Ratio Perm							0.02				c0.07	
v/c Ratio	0.84	0.52		0.75	0.54		0.15	0.01			0.41	
Uniform Delay, d1	18.5	6.3		18.9	6.8		13.8	13.5			14.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	60.7	0.3		65.2	0.3		0.3	0.0			1.2	
Delay (s)	79.2	6.6		84.0	7.2		14.1	13.5			15.6	
Level of Service	E	A		F	A		B	B			B	
Approach Delay (s)		10.6			9.1			14.0			15.6	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			10.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			38.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			52.0%			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
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	786	23	15	747	44	16	3	8	57	2	77
Future Volume (vph)	66	786	23	15	747	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	
Frpb, 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)	71	845	25	16	803	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)	71	869	0	16	847	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)	6.9	54.8		1.3	49.2			7.2		9.7	9.7	
Effective Green, g (s)	6.9	54.8		1.3	49.2			7.2		9.7	9.7	
Actuated g/C Ratio	0.08	0.61		0.01	0.55			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)	135	2144		25	1914			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	0.53	0.41		0.64	0.44			0.15		0.61	0.12	
Uniform Delay, d1	40.0	9.1		44.1	12.2			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	1.7	0.6		35.0	0.7			0.2		4.0	0.1	
Delay (s)	41.7	9.7		79.1	12.9			38.7		42.4	36.4	
Level of Service	D	A		E	B			D		D	D	
Approach Delay (s)		12.1			14.2			38.7			38.9	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			16.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				17.0		
Intersection Capacity Utilization			46.0%			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
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		  	 		 	 		 	 	
Traffic Volume (vph)	166	465	177	341	376	187	314	379	296	150	277	168
Future Volume (vph)	166	465	177	341	376	187	314	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	3339		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	3339		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	484	184	383	422	210	334	403	315	165	304	185
RTOR Reduction (vph)	0	0	138	0	41	0	0	12	160	0	0	145
Lane Group Flow (vph)	173	484	46	383	591	0	334	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	20.6	20.6	12.5	23.6		13.8	22.5	22.5	9.3	18.0	18.0
Effective Green, g (s)	9.5	20.6	20.6	12.5	23.6		13.8	22.5	22.5	9.3	18.0	18.0
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)	393	879	387	752	950		571	890	384	385	768	338
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	34.2	27.1	24.1	32.4	25.8		31.9	25.8	23.0	34.3	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)	34.5	28.0	24.3	32.6	27.2		32.9	26.7	23.2	34.6	28.3	26.3
Level of Service	C	C	C	C	C		C	C	C	C	C	C
Approach Delay (s)		28.6			29.2			27.9			29.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.7			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			82.9			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			57.5%			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
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 					
Traffic Volume (vph)	21	972	361	58	889	8	414	3	91	2	1	19
Future Volume (vph)	21	972	361	58	889	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	1002	372	65	999	9	470	3	103	3	1	24
RTOR Reduction (vph)	0	0	91	0	0	0	0	82	0	0	0	23
Lane Group Flow (vph)	22	1002	281	65	1008	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	0.33	0.60	0.28		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	18.4	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)		19.2			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
12/13/2018

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	18	0	0	14	26	20
Future Volume (vph)	18	0	0	14	26	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	0	15	28	22
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	20	15	50			
Volume Left (vph)	20	0	28			
Volume Right (vph)	0	15	22			
Hadj (s)	0.23	-0.57	-0.12			
Departure Headway (s)	4.3	3.5	3.9			
Degree Utilization, x	0.02	0.01	0.05			
Capacity (veh/h)	831	1019	913			
Control Delay (s)	7.4	6.5	7.1			
Approach Delay (s)	7.4	6.5	7.1			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.0			
Level of Service			A			
Intersection Capacity Utilization			17.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

2: Sherburne Hills Rd & Camino Tassajara

P.M. Peak
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	1091	33	11	648	43	22	2	9	45	0	42
Future Volume (vph)	43	1091	33	11	648	43	22	2	9	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	
Frpb, 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	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	
Satd. Flow (prot)	1770	3521		1770	3499		1770	1630			1697	
Fit Permitted	0.95	1.00		0.95	1.00		0.81	1.00			0.83	
Satd. Flow (perm)	1770	3521		1770	3499		1514	1630			1442	
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	1173	35	12	704	47	37	3	15	62	0	58
RTOR Reduction (vph)	0	2	0	0	4	0	0	13	0	0	63	0
Lane Group Flow (vph)	46	1206	0	12	747	0	37	5	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	2030		32	1945		197	212			188	
v/s Ratio Prot	c0.03	c0.34		0.01	0.21			0.00				
v/s Ratio Perm							0.02				c0.04	
v/c Ratio	0.68	0.59		0.38	0.38		0.19	0.02			0.30	
Uniform Delay, d1	20.7	6.0		21.2	5.5		16.9	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	0.5		7.2	0.1		0.5	0.0			0.9	
Delay (s)	44.2	6.4		28.4	5.6		17.4	16.6			18.1	
Level of Service	D	A		C	A		B	B			B	
Approach Delay (s)		7.8			6.0			17.1			18.1	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		8.0					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
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	1053	32	26	633	67	18	2	10	49	1	44
Future Volume (vph)	52	1053	32	26	633	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)	57	1157	35	28	688	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)	57	1191	0	28	756	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)	6.3	55.6		2.9	52.2			7.7		6.8	6.8	
Effective Green, g (s)	6.3	55.6		2.9	52.2			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)	123	2175		57	2016			146		133	119	
v/s Ratio Prot	c0.03	c0.34		0.02	0.22			c0.02		c0.04	0.00	
v/s Ratio Perm												
v/c Ratio	0.46	0.55		0.49	0.37			0.23		0.48	0.05	
Uniform Delay, d1	40.2	9.9		42.8	10.1			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	1.0	1.0		2.4	0.5			0.3		1.0	0.1	
Delay (s)	41.2	10.9		45.2	10.7			38.7		40.9	38.6	
Level of Service	D	B		D	B			D		D	D	
Approach Delay (s)		12.3			11.9			38.7			39.8	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			14.3			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			55.4%			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
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	628	200	307	406	202	404	454	419	203	304	151
Future Volume (vph)	173	628	200	307	406	202	404	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
Flpb, 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	3325		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	3325		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	698	222	330	437	217	412	463	428	218	327	162
RTOR Reduction (vph)	0	0	143	0	39	0	0	18	196	0	0	125
Lane Group Flow (vph)	192	698	79	330	615	0	412	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	29.3	29.3	12.3	31.2		16.8	28.1	28.1	11.2	22.5	22.5
Effective Green, g (s)	10.4	29.3	29.3	12.3	31.2		16.8	28.1	28.1	11.2	22.5	22.5
Actuated g/C Ratio	0.11	0.30	0.30	0.12	0.32		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	1048	459	620	1048		583	923	402	388	805	352
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						0.05			0.02
v/c Ratio	0.53	0.67	0.17	0.53	0.59		0.71	0.65	0.19	0.56	0.41	0.10
Uniform Delay, d1	41.9	30.5	25.8	40.6	28.4		38.7	31.1	26.8	41.5	32.5	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.8	0.2	0.4	1.0		3.2	1.8	0.3	1.1	0.5	0.2
Delay (s)	42.7	32.3	26.1	41.0	29.4		41.9	32.8	27.1	42.6	33.0	30.4
Level of Service	D	C	C	D	C		D	C	C	D	C	C
Approach Delay (s)		32.8			33.3			34.5			35.4	
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)			98.9			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
12/13/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 					
Traffic Volume (vph)	30	1217	514	80	608	6	437	6	127	32	22	93
Future Volume (vph)	30	1217	514	80	608	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	1242	524	83	633	6	486	7	141	44	31	129
RTOR Reduction (vph)	0	0	128	0	1	0	0	107	0	0	0	120
Lane Group Flow (vph)	31	1242	396	83	638	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	29.7	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)		31.9			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												